

**FISCAL YEAR 2005
SOLICITATION FOR COOPERATIVE
AGREEMENT PROPOSALS**

Grand Canyon Monitoring and Research Center
2255 N. Gemini Dr.
Flagstaff, AZ 86001

Aquatic Foodbase Research Activities

**Identifying pathways linking lower trophic levels with
native and non-native fish in the Colorado River,
Grand Canyon**

U.S. Geological Survey
May 17, 2005

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SECTION A. INTRODUCTION

Geographic and Institutional Scope

The geographic scope of Grand Canyon Monitoring and Research Center's (GCMRC) activities is the Colorado River ecosystem within Glen Canyon National Recreation Area and Grand Canyon National Park. The Colorado River ecosystem¹ is defined as the Colorado River mainstem corridor and interacting resources in associated riparian and terrace zones, located primarily from the forebay of Glen Canyon Dam (GCD) to the western boundary of Grand Canyon National Park, a distance of approximately 293 river miles. The scope of GCMRC activities includes limited investigations into tributaries. It also includes, in general, cultural resource impacts of dam operations for inundation levels associated primarily with flows up to 256,000 cubic feet per second (cfs) as addressed in the Programmatic agreement², and for physical, biological, recreational and other resources, impacts of dam operations for inundation levels associated primarily with flows up to 100,000 cfs. In between these levels, stakeholder concerns with respect to relict native vegetation, endangered species, and cultural resources may require activities by the GCMRC. All proposed projects relate to scientific activities intended to obtain information on "... the effects of the Secretary's actions³..." primarily on downstream resources located in the Colorado River ecosystem.

GCMRC scientific activities are constrained to those probable effects on downstream resources associated with dam operations; for this reason upstream monitoring by GCMRC in Lake Powell, and downstream in tributaries, (i.e., Little Colorado River) are constrained by design. Participants in the Glen Canyon Dam Adaptive Management Program (GCDAMP) realize these to be constraints that inhibit understanding of the entire ecosystem and therefore accept that scientific information from programs outside the GCDAMP may be needed as a means of strengthening understanding of the entire Colorado River ecosystem. Nevertheless, the ultimate purpose of GCMRC monitoring and research activities is to develop information on changes in the Colorado River ecosystem related to "... the effects of the Secretary's actions..." primarily on "downstream resources."

Mission of GCMRC

The Grand Canyon Protection Act (GCPA), and the Operations of Glen Canyon Dam – Final Environmental Impact Statement (GCDEIS), direct the Secretary of the Interior, "To establish and implement long-term monitoring programs and activities that will ensure that Glen Canyon Dam is operated in a manner consistent with that of Section 1802..." of the GCPA. The mission of the GCMRC is:

"To provide credible, objective scientific information to the GCDAMP on the effects of operating Glen Canyon Dam on the downstream resources of the Colorado River ecosystem, as well as other information needs specified by the AMWG, utilizing an ecosystem science approach."

1 "Colorado River ecosystem" will be used throughout this document as the standard definition of the monitoring and study area for GCMRC. This definition is consistent with that used in the FY 1997-2002 Strategic Plan.

2 The Programmatic Agreement, finalized in August 1994, is a legal agreement between federal and state agencies and tribal groups that specifies the responsibilities of the parties to comply with the National Historic Preservation Act (1996; 1992) and 36 CFR 800. This program is the responsibility of the Bureau of Reclamation.

3 As specified in the 1992 GCPA and in the Record of Decision for the Glen Canyon Dam EIS (DOI 1996).

The Adaptive Management Work Group (AMWG) is composed of concerned stakeholders that represent federal and state agencies, tribal groups, environmental and recreational groups, and power customers. These groups have been officially identified by the Secretary of the Interior and serve on a special Federal Advisory Committee (the AMWG) to advise the secretary on the effects of her actions and the operations of Glen Canyon Dam on downstream resources.

Ensuring Objective, Quality Science

The GCMRC was established to provide objective, high quality scientific information to the Secretary of the Interior and to the Adaptive Management Work Group (AMWG). To accomplish these goals, specific protocols regarding science planning, competition, peer review, administration and publication have been established. The quality and objectivity of GCMRC research findings is ensured through competition and independent external scientific peer review. All technical proposals, data, reports, etc. are reviewed by independent, external scientists as well as by the GCMRC science team.

To ensure that the long-term monitoring and research activities initiated by the GCMRC are unbiased, objective, and scientifically sound, an independent panel of Science Advisors was established to advise the GCMRC, the Adaptive Management Work Group, and the Secretary of the Interior on the coordination and planning of its monitoring and research programs, and to review the results of GCMRC monitoring and research programs. The Science Advisors serve as an advisory, not a decision-making, body. The Science Advisors form an interdisciplinary board composed of scientists who were competitively selected based on their record of scientific achievement, in a range of disciplines related to the work of the GCMRC.

GCMRC Scientific Activities

The FY05 Annual Work Plan describes monitoring and research activities that address the management objectives (MOs) and prioritized information needs (INs) of the GCDAMP (http://www.gcmrc.gov/news_info/outreach/gcmrc_plans/gcmrc_plans.htm). Long-term monitoring is designed to determine changes in resource attributes. Research is used to improve monitoring, interpret and explain trends observed from monitoring to determine cause-and-effect relationships and research associations, and to better define interrelationships among physical, biological and social processes.

In addition to monitoring and research activities, the GCMRC operates a Data Acquisition, Storage and Analysis program (DASA) that is designed to ensure proper data management, data integration and analysis, and data dissemination to managers, stakeholders and scientists. The DASA program incorporates the fields of Database Management Systems (DBMS), Geographic Information Systems (GIS), Remote Sensing and other data acquisition technologies (e.g. satellite telemetry) into a cohesive unit designed to support the research and monitoring needs of the GCMRC science objectives. Additionally, the DASA group provides for access to spatial and tabular data via web services such the Internet Map Server (IMS) and the Water Flow & Elevation Data web access page.

The GCMRC also employs a surveying group to provide consistent, quality, cost-effective support that provides and maintains federally compliant and spatial accurate data that is vital to monitoring and research projects, and a logistics program to provide cost-effective support to monitoring and research field activities.

Current Knowledge

For information on current knowledge of Colorado River ecosystem resources, please see the FY05 Annual Work Plan (http://www.gcmrc.gov/news_info/outreach/gcmrc_plans/gcmrc_plans.htm).

Ownership and Access to Scientific Data

All data and supporting information generated and resulting from this effort are to be delivered to the GCMRC under the terms of individual project agreement. One critical role of GCMRC is to make all data and reports regarding this ecosystem program widely available to all stakeholders and other interested parties. In the spirit of cooperative agreement, the GCMRC strives to make all such scientific data available both electronically through its web site, and through other means described below. Therefore, it is necessary that the government have license/rights and access to the scientific data and related reports from studies, analyses, raw data, or similar data produced for this effort, since the studies, analyses, et al are specified as an element of performance of this effort, and will be developed exclusively with government funds. It is the Government's intent to exercise the Government's rights in this area in accordance with OMB Circulars A-110 and A-102.

Program Integration

All GCMRC monitoring and research programs utilize ecosystem science approaches that require integrated studies that conform to the appropriate spatial and temporal scales of the issues at hand. As the 1995 report of the Ecological Society of America Committee on the Scientific Basis of Ecosystem Management indicates, the incorporation of good science into management decisions at a landscape level is an essential component of ecosystem management. An ecosystem approach will serve to advance both scientific understanding and management capabilities, while supporting protection, management, and use of natural resources.

Contingency Planning

The Technical Work Group (TWG), technical representatives of the AMWG, and AMWG have adopted hydrologic criteria and resource criteria for triggering releases above peak power-plant capacity from Glen Canyon Dam (such as Beach/Habitat-Building Flows). When triggered, these criteria provide little lead time for monitoring and research planning. In addition, hydrologic conditions can lead to unplanned release events which will also require GCMRC to implement monitoring and research activities with little to no lead time. The potential for these events to occur results in the need for contingency planning. Annually, GCMRC will develop contingency plans for implementation of:

- (1) Supplemental monitoring before and/or after unplanned events, as appropriate
- (2) Research assessments of flows above peak power-plant capacity (as per the GCDEIS) or other short-duration high flow unplanned events.
- (3) A supplemental monitoring and research program for planned events.

Funding to support monitoring and research activities beyond those which constitute annual monitoring and planned research activities (described in the FY05 Annual Work Plan) will be sought from the U.S. Geological Survey and the Western Area Power Administration

subject to the recommendation of the AMWG/TWG. You will find a requirement for Contingency Planning in the Program Description for this effort.

Science Symposium and SCORE Reporting

The GCMRC has initiated a program of regular scientific symposia to discuss the current state of the knowledge of scientific information regarding the Colorado River ecosystem, as well as to learn about similar research in other systems. The GCMRC convenes a biennial Colorado River ecosystem science symposium, and between these years GCMRC program managers and participating scientists make presentations at the biennial Colorado Plateau symposium hosted by the Colorado Plateau Field Station of the Biological Resources Division of the USGS. GCMRC hosted scientific symposia in 1997, 1999, 2001, and 2003 and plans to do so again in 2005. Typically, these meetings are held in the Fall.

The GCMRC will also be summarizing the state of our knowledge of the CRE in a report titled “The State of Natural & Cultural Resources in the Colorado River Ecosystem” (SCORE). This report will present a comprehensive analysis of the CRE, including chapters on hydropower, sediment, fish, the aquatic foodbase, terrestrial vegetation, cultural resources, and recreational values. This report will be available to the public in October 2005.

Future Challenges

GCMRC and the adaptive management program, in general, face a number of challenges with respect to designing monitoring and research activities to gather information on specific experimental management actions. These include the implementation of long-term experimental plans that include changes in the daily range of discharge (e.g., 5000 – 20,000 ft³/s to 6,500 – 9,000 ft³/s to steady 8,000 ft³/s), and manipulation of the system in addition to dam operations such as exotic fish removal. Respondents to this solicitation should be cognizant of how these factors may affect their research plans.

SECTION B. FISCAL YEAR 2005 PROGRAM ANNOUNCEMENT

Program Authority: Grand Canyon Protection Act, PL 102-575

Research & Data Collection.

An award made in response to this Program Announcement is dependent upon responsiveness to the announcement, the quality of the technical proposal regarding monitoring, research, associated scientific activities, the cost, as well as other explicit criteria outlined in this Announcement. **Unsatisfactory performance by a recipient under prior Federal awards may result in an application not being considered for funding.** Period of performance for this effort may be from one to three years. Initial funding will be for one year, and may or may not be renewable annually on the basis of available funding and progress. The approximate amount available for this effort is listed in the Program Description. Additional budget information on the FY 2005 GCMRC program can be found in the Annual Work Plan (http://www.gcmrc.gov/news_info/outreach/gcmrc_plans/gcmrc_plans.htm).

Technical proposals will be evaluated by qualified external Peer Reviewers and GCMRC program managers. Peer Reviewers are experts who are familiar with the technical aspects of the field of study which this application addresses. Technical proposals will be evaluated against general and initiative-specific criteria identified in the announcement.

Final selection of awardees will be based on recommendations of Peer Reviews, programmatic considerations, and compliance with all appropriate federal regulations. Upon conclusion of scientific Peer Review, GCMRC review, and Acquisitions Agreement review, a meritorious application will be awarded by the USGS Contracting Officer.

Submittals and Application Closing Date

Do not send proposals directly to the GCMRC. Facsimile transmissions and electronic mail submissions will not be accepted.

Address applications to:

Mail: **U. S. Geological Survey
Western Region Service Center
Branch of Acquisition and Grants
3020 State University Drive East, Suite 3001
Sacramento, CA 95819
Attention: Sonya Baird**

Hand Delivery: Same address.

The closing date for this application is 4:30 P.M. Pacific Daylight Time, July 15, 2005.

Amendments to the Solicitation

- (a) If this solicitation is amended, then all terms and conditions that are not modified remain unchanged.

- (b) Applicants shall acknowledge receipt of any amendment to this solicitation by identifying the amendment number and date in the space provided for this purpose on the form for submitting an application.

Late Submissions

- (a) Any proposal received at the office designated in the solicitation after the specified deadline will **not** be considered unless it:
 - (1) Was sent by registered or certified mail not later than the fifth calendar day before the date specified for receipt of offers (e.g., an offer submitted in response to a solicitation requiring receipt of offers by the 30th of the month must have been mailed by the 25th); or
 - (2) Was postmarked by the appropriate date, and it is determined by the Government that the late receipt was due solely to mishandling by the Government after receipt at the Government installation.
- (b) The only acceptable evidence to establish the date of mailing of a late proposal sent either by registered or certified mail is the postmark on the wrapper or on the original receipt. If neither postmark shows a legible date, the proposal, quotation, or modification shall be processed as if mailed late. "Postmark" means a printed, stamped, or otherwise placed impression (exclusive of a postage meter machine impression) that is readily identifiable without further action as having been supplied and affixed by employees of the U.S. Postal Service on the date of mailing. Therefore, offerors or quoters should request the postal clerks to place a hand cancellation bull's-eye postmark on both the receipt and the envelope or wrapper.
- (c) The only acceptable evidence to establish the time of receipt at the Government installation is the time/date stamp of that installation on the proposal wrapper or other documentary evidence of receipt maintained by the installation.
- (d) The proposal is not binding until both parties sign the final agreement. Proposals may be withdrawn by written notice received at any time before the agreement is signed.

Retention/Disposition of Materials

Materials submitted in response to this announcement will not be returned. Originals will be retained, by the Government, for official record purposes. Material supplied to the applicant by the GCMRC (including attachments and specifications) need not be returned to the procuring office, and may be discarded unless otherwise specifically directed.

Unsolicited Proposals

GCMRC accepts technical proposals for research that does not fit within the scope of this specific announcement. We strongly recommend that a 1-2 page white paper be submitted for consideration prior to full development of the technical proposal. We encourage submission of a white paper consistent with this Program Announcement deadline to facilitate review. However, unsolicited proposals that do not meet the deadline will be considered subsequently and based on available funds and appropriateness of the research proposed.

Pre-Proposal Open Meeting

GCMRC scientists will convene a pre-proposal meeting to answer questions from, and initiate a dialog with, persons interested in responding to this solicitation. This meeting is not mandatory; however, all potential respondents are strongly encouraged to attend. Meeting minutes will be posted on the GCMRC website for those unable to attend. The meeting will be held at a meeting room in Phoenix Sky Harbor Airport on June 6, 2005 from noon-3pm. Theodore Kennedy, Barb Ralston, Ted Melis, and possibly others, from GCMRC will convene the meeting. Please see the GCMRC website for details on meeting location (http://www.gcmrc.gov/news_info/rfps-jobs/rfps-jobs.htm). If you plan to attend this open-meeting, please notify Theodore Kennedy (tkennedy@usgs.gov) and include the subject line 'pre-proposal open meeting'.

Further Information and Comments on the Process

Further information regarding GCMRC activities, if needed, may be obtained from the U.S. Geological Survey (USGS) officials indicated below:

Theodore S. Melis, Ph.D., Physical Science, Modeling and DASA Program Manager, and
Acting Chief of GCMRC
email: tmelis@usgs.gov
voice: 928/556-7282
fax: 928/556-7092

Biological Resources
Barbara E. Ralston, Ph.D., Acting Program Manager
email: bralston@usgs.gov
voice: 928/556-7455
fax: 928/556-7092

Cultural and Socioeconomic Resources
Ms. Helen Fairley, Program Manager
email: hfairley@usgs.gov
voice: 928/556-7285
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Information Officer
Mike Liszewski, Director
email: mjlisz@usgs.gov

voice: 928-556-7458
fax: 928-556-7092

Logistics and Survey Support
Carol Fritzinger, Coordinator
email: cfritz@usgs.gov
voice: 928-556-7207
fax: 928-556-7092

Branch of Acquisition and Federal Assistance
Sonya Baird, Contract Specialist
email: sbaird@usgs.gov
voice: (916) 278-9332
fax: (916) 278-9339

Suggestions for improving this process in future announcements are welcome and should be sent, under separate cover, to Dr. Theodore S. Melis, Acting Chief, Grand Canyon Monitoring and Research Center, 2255 N. Gemini Dr., Flagstaff, AZ 86001-1637.

Questions associated with this solicitation may be submitted electronically to the GCMRC (tkennedy@usgs.gov) until July 15, 2005. Please include the subject line 'Food Web Solicitation' in any correspondence. Responses will be posted during the solicitation period at the GCMRC website every Friday until July 22, 2005 (http://www.gcmrc.gov/news_info/rfps-jobs/rfps-jobs.htm).

SECTION C. PROGRAM DESCRIPTION AND FEDERAL INVOLVEMENT

Aquatic Foodbase Research Activities

Project:

Introduction

Since the closure of Glen Canyon Dam (GCD) and the beginning of flow regulation of the Colorado River ecosystem (CRE) through Grand Canyon in 1963, considerable efforts have been directed toward understanding the aquatic ecology of this altered ecosystem (Blinn and Cole, 1991). The CRE supports the largest extant population of endangered humpback chub (*Gila cypha*, listed as Endangered in 1967 by Executive Order) and the upper reaches of the CRE support a recreational rainbow trout (*Oncorhynchus mykiss*) fishery while piscivorous brown trout (*Salmo trutta*) are common in the lower reaches, particularly near Bright Angel Creek; understanding the factors that regulate populations of the fish in the CRE is of central importance to the Glen Canyon Dam Adaptive Management Program. Because food is the factor that most often limits the density of animal populations in a given habitat (Krebs, 1994), the aquatic foodbase of the CRE has been the focus of a great deal of research. These efforts have yielded numerous insights including an understanding of spatial and temporal variability in the standing mass of algae, drifting and benthic organic matter, and invertebrates, and the impacts that different GCD discharge regimes have on lower trophic levels within the CRE. However, there remains considerable uncertainty regarding linkages between the standing mass of lower trophic levels and food availability for native and non-native fishes in the CRE (Anders and others, 2001). The purpose of this solicitation is to initiate research that will identify the trophic pathways that are of importance to humpback chub, rainbow trout, and brown trout in the CRE and to develop new foodbase monitoring protocols that can accurately characterize food availability for these fish in the CRE.

Setting and Background

The CRE is defined as the Colorado River mainstem corridor, tributary streams, and adjacent terrestrial habitats, that are located between the forebay of Glen Canyon Dam (GCD) and the western boundary of Grand Canyon National Park, a distance of approximately 293 river miles that is punctuated by frequent rapids and over 1700 feet in elevation loss. Access to the CRE is extremely limited and consists of vehicle access at the upper and lower end of the CRE, scattered foot paths that descend several thousand vertical feet into the Grand Canyon, or boat-based river trips that are launched from the upper end of the CRE and travel the entire length of the CRE. The remote nature and setting of the CRE within Grand Canyon National Park makes for a spectacular research site, but it also presents considerable challenges to researchers. Large daily fluctuations in discharge, cold water temperatures, and deep water and strong currents limit the areas of the CRE that can be sampled and generally make sampling and the installation of research equipment extremely difficult. Boat trips provide the most effective means of accessing the CRE, but because it takes a week or more to complete such a trip freezing samples, one of the best/only means of preserving samples that will eventually be analyzed for stable isotope ratios or fatty acid signatures, is not possible. Further, the time and expense of boat trips (1-2

weeks, ~\$10,000-40,000 per trip) severely limits the spatial and temporal intensity of any sampling regime.

The importance of the aquatic foodbase and its relationship to other ecosystem components are reflected in the goals of the Glen Canyon Dam Adaptive Management Program; the Program's first goal is to: "*Protect or improve the aquatic foodbase so that it will support viable populations of desired species at higher trophic levels*" (Glen Canyon Dam Adaptive Management Working Group, Strategic Plan 2001). Some recent trends for important fish in the CRE may be partially due to changes in food availability and/or quality and highlight the need for more research on the aquatic foodbase: the condition (weight-at-length) and size of humpback chub populations within the CRE have both declined since intensive measurements began about 20 years ago (Johnstone and Laretta, 2004; Meretsky and others, 2000) and the condition of rainbow trout within Glen Canyon declined during the late 1990's (McKinney and Speas, 2001). Documenting the pathways that link lower trophic levels with humpback chub and trout, and developing new protocols for monitoring the aquatic foodbase, will help clarify the role that food availability/quality plays in determining the distribution, density, and condition of these important fish.

Efforts and results to date

Closure of GCD changed the Colorado River through Grand Canyon from a river with highly variable discharge rates and temperatures, and high suspended sediment loads, to one characterized by a relatively constant flow regime (Topping and others, 2003, Note: hydrograph data for the Colorado River can be readily downloaded from the GCMRC website), cold and constant water temperatures, and suspended sediment loads that are <10% of pre-dam levels (Topping and others, 2000). Further, much of the organic matter that was formerly supplied to the Colorado River is also trapped behind GCD. These changes have led to dramatic shifts in the structure of the aquatic food web of the CRE (Blinn and Cole, 1991).

Conceptual and mathematical modeling of the CRE has provided the GCMRC with a valuable framework for planning, prioritizing, and integrating research. Patten (1991) developed one of the first comprehensive conceptual models of the CRE that detailed potential interrelationships between important drivers and the physical, biological, and cultural resources present. The Grand Canyon Ecosystem Model (GCEM--Korman and Walters, 1998; Walters and others, 2000) has provided managers and scientists with a means to evaluate the response of system components (i.e., fish populations, algae standing mass, etc.) to various policy options (i.e., change in flow regime, water temperature, etc.). The User's Guide to this model highlights data gaps, including gaps in our knowledge of important foodbase components and drivers, that became evident during the process of model development. The Colorado River Flow Stage & Sediment Model (CRFSS) refined portions of the physical components of the GCEM and allows users to estimate hydrographs, river stage, and water travel time and velocity at downstream locations. These flow models have recently been used to determine the effects of discharge on habitat quality and dispersal of juvenile humpback chub in the system (Korman and others, 2004). The GCEM and User's Guide, and the CRFSS, can be downloaded from the Products→Simulation Models tab of the GCMRC website.

Yard and others (2005) measured and modeled the influence of canyon orientation and topographic complexity on solar inputs to the Grand Canyon ecosystem. One of the most striking results of these efforts is that reaches that are oriented East-West receive less solar radiation during the winter months, but more radiation during the summer months, relative to North-South

reaches. As the sun traces a path across the horizon during the winter months, along N-S reaches the river is in clear view of the sun, but along E-W reaches, particularly ones that are in deep sections of the canyon, the sun never gets high enough on the horizon to directly shine on the river. In contrast, the sun is high on the horizon during the summer months and shines directly on E-W reaches for most of the day, but N-S sections are shaded for long periods during the morning and afternoon. Thus, Yard and others (2005) predict that algae production should vary predictably with canyon orientation and season due to differences in solar radiation, in addition to the general downstream decline in algae production that is associated tributary sediment inputs.

Previous foodbase solicitations were largely directed towards documenting spatial and temporal variability of algae and its associated invertebrates, and understanding what controls the standing mass of algae and invertebrates, but there is now evidence that other types of organic matter are more abundant at downstream locations within the CRE and may be contributing to secondary production there. The standing mass of algae is extremely high in the upper reaches of the CRE within Glen Canyon, but there are abrupt declines in algal biomass downstream of major tributaries (i.e. Paria River and Little Colorado River) because of episodic inputs of suspended sediments that reduce water clarity and scour benthic algae (Shaver and others, 1997; Stevens and others, 1997). Lieberman and Burke (1993) documented an overall downstream increase in allochthonously derived Particulate Organic Matter (POM) concentration along the lower Colorado River, from Davis Dam to Yuma, and found evidence that it was contributing to secondary production. Researchers have found similar downstream patterns of POM increase along the CRE (Benenati and others, 2001; Shannon and others, 1996).

Downstream shifts in the density of aquatic invertebrates are consistent with the aforementioned shifts in organic matter availability. Algivorous *Gammarus lacustris* and New Zealand mudsnails (*Potamopyrgus antipodarum*) are the dominant invertebrates at upstream locations while simuliid larvae that filter-feed POM are the dominant invertebrate at downstream locations (Benenati and others, 2002; Stevens and others, 1997). Further, Stevens and others (1997) found a downstream decrease in the relative abundance of algae in the guts of chironomids, from 61.4% of gut contents by volume in Glen Canyon to just 7.5% percent at river mile 224.

The food items consumed by trout and humpback chub appear to reflect these downstream shifts in algal and invertebrate density. *Gammarus lacustris*, chironomids, and *Cladophora glomerata* are the most common items consumed by rainbow trout in Glen Canyon (Angradi, 1994; McKinney and Speas, 2001) while simuliids appear to be the most common food item for rainbow trout near the confluence with the Little Colorado River (LCR) at ~river mile 61 (Mike Yard, oral communication 2005). Brown trout from the LCR confluence, and presumably the CRE as a whole, are more piscivorous than rainbow trout but still consume significant quantities of simuliids (Mike Yard, oral communication 2005). Simuliids also appear to be the most common food item for humpback chub in the vicinity of the LCR confluence and further downstream in Middle Granite Gorge at ~ river mile 126 (Valdez and Ryel, 1995). While these studies provide compelling evidence of a downstream shift in the feeding habits of two fish in the CRE, these diet analyses were geographically restricted to areas of high fish density; virtually nothing is known about the feeding habits of trout or humpback chub at other locations.

There is also direct evidence that allochthonous carbon influences stream dynamics and

contributes to secondary production at downstream sites in the CRE. Few organic matter retention mechanisms exist in the CRE, with the exception of in-stream channel deposits and lateral bar attachments. However, organic matter (both allochthonously and autochthonously derived) associated with these retention mechanisms has a measurable influence on benthic respiration and nutrient concentrations via leaching and organic matter breakdown (Parnell and Bennett, 1999). Thus, where detrital carbon accumulates it can have a significant influence on in-stream processes. Angradi (1994) investigated trophic linkages in the CRE using stable isotope analysis and found that the food web in Glen Canyon was supported almost entirely by locally derived algal carbon, but secondary production at downstream tributaries was supported by a variety of carbon sources that included riparian and upland vegetation. However, it should be noted that Shannon and others (2001) documented downstream enrichment of carbon stable isotope values for algae, aquatic invertebrates, and fish that may complicate interpretation of stable isotope data.

The 1996 controlled flood in Grand Canyon presented a unique opportunity to understand the impact that short duration floods have on the CRE (Webb and others, 1999). Blinn and others (1999) found the 1996 controlled flood scoured >90% of the primary producer biomass (i.e., algae and submerged aquatic plants) and ~50% of the river bottom invertebrates from a site in the Glen Canyon reach; both primary producers (1 month) and invertebrates (2 months) quickly recovered to pre-flood levels. In contrast, McKinney and others (1999) found the 1996 flood caused short-term reductions in the standing mass of primary producers and invertebrates only in depositional habitats (i.e., areas of sand/silt), but not in more resistant habitats like cobble bars. Even though the flood may have reduced the standing mass of invertebrates from some areas in the Glen Canyon reach, the quantity of foodbase items in rainbow trout stomachs was actually greater immediately after the flood relative to before the flood (McKinney and others, 1999). Two different methods were used to quantify aquatic primary production during the constant $8,000 \text{ ft}^3 \cdot \text{s}^{-1}$ flows that occurred before and after the flood—closed circulating chambers and whole system metabolism measurements (Brock and others, 1999; Marzolf and others, 1999). Both types of measurements indicated there was a significant decrease in primary production due to the controlled flood. Although Marzolf et al. (1999) did not estimate reaeration flux, and were thus unable to actually quantify ecosystem respiration and production, they were able to detect a significant decrease in net dissolved oxygen production in three different reaches in Lees Ferry following the controlled flood and attributed this to the decline in primary producer biomass that was noted by other investigators (Blinn and others, 1999; McKinney and others, 1999).

Scientists from GCMRC have recently initiated a research program in the Glen Canyon reach to fully develop the methods for implementing whole stream metabolism measurements in the Colorado River. Preliminary data indicate that reaeration rates are primarily determined by wind speed, while fluctuations in discharge have only a minor influence on these rates (Theodore Kennedy, *unpublished data*); the wind speed-reaeration flux relationship for the Lees Ferry reach is virtually identical to that reported by Marino and Howarth (1993) for the Hudson River. GCMRC scientists have also determined that the Lees Ferry reach of the Colorado River is relatively well mixed (i.e., only slight differences in dissolved oxygen concentration between surface and bottom water; Kennedy, *unpublished data*). However, considerable challenges remain before widespread use of this method is feasible under normal dam operations. Countless large rapids at locations downstream of Lees Ferry effectively reset the oxygen balance of the CRE and limit the locations where it will be possible to conduct whole stream metabolism

measurements. Large diel variations in water velocity (up to 2-fold change daily) that are driven by fluctuations in discharge from GCD (up to $8,000 \text{ ft}^3\text{-s}^{-1}$ variation daily) both present a considerable challenge to oxygen mass flux calculations that will have to be overcome before metabolism measurements can be conducted during normal dam operations. Finally, limited access to the CRE prevents frequent recalibration of dissolved oxygen sensors, thereby limiting the amount of useful data that can be taken from data-logging water quality monitors.

Despite these challenges, whole stream metabolism measurements represent a potentially important new direction for quantifying resource availability that respondents to this solicitation should consider utilizing. There is considerable variation in channel depth, substrate types (e.g. cobble, boulder, fines, etc.), and the density of grazing invertebrates within and among reaches (Melis, 1997; Stevens and others, 1997). This variability makes estimating algal production rates at a system-wide scale based on chamber measurements or algal biomass estimates virtually intractable; whole stream metabolism measurements are ideal in this type of situation because they yield an estimate of system production and respiration that is integrated in both space and time. Further, estimates of ecosystem respiration may provide an indication of allochthonous carbon abundance and utilization (i.e., Meyer and Edwards, 1990).

Project Objectives

As the above review indicates, there is considerable evidence that both autochthonous and allochthonous organic matter may be contributing to secondary production within the CRE. The purpose of this solicitation is to initiate new research that will take a broad view of the aquatic foodbase and identify trophic pathways, whether autochthonous or allochthonous, that are important to fishes in the CRE and then develop new foodbase monitoring protocols that can accurately characterize food availability for fish in the CRE. Research proposals must also attempt to determine the origins of organic matter that contribute significantly to secondary production using stable isotopes (Peterson and Fry, 1987) or other means (e.g., fatty acid signatures, Iverson and others, 2004). For example, considerable quantities of filamentous algae are exported from Glen Canyon, pulverized by rapids and converted to POM, and delivered to downstream reaches (Benenati and others, 2001; Shannon and others, 1996); it is possible that POM derived from Glen Canyon algae is contributing to secondary production at downstream reaches. Further, the importance of allochthonous organic matter to secondary production is likely to vary spatially and temporally given fundamental differences in the two main sources of allochthonous inputs to the CRE—inputs of leaf litter from riparian vegetation adjacent to the mainstem CRE that occur principally in the fall and winter, and upland and riparian vegetation that is delivered to the CRE during tributary flooding events that can occur throughout the year.

As noted above, our understanding of the feeding habits of trout and humpback chub is based on studies from a limited number of locations. Thus, to the extent that logistics, the budget, and the restrictions associated with studying Endangered Species Act listed or candidate species permit, proposals should attempt to determine important trophic linkages for both humpback chub and rainbow trout in the CRE from a range of sites along the entire 240 miles of the CRE. (Note: Reports by Rogers and others (2003) and Johnstone and Loretta (2004) provide data on the distribution and abundance of non-native and native fish in the CRE). Although there is a great need to determine the pathways that link lower trophic levels with humpback chub, given the status of this fish in the CRE we do not seek research proposals that will directly quantify their feeding habits via procedures such as gut-pumping or gut-content analysis. However, we do welcome proposals that will use stable isotope analysis of humpback chub fin

clips or other tissues to make inferences about important trophic linkages for these fish. Further, given their similar food habits, it seems reasonable and prudent to use rainbow trout feeding habits as a proxy for humpback chub.

When designing research plans, respondents to this solicitation are strongly encouraged to consult the Protocol Evaluation Panel (PEP) review of aquatic programs at GMCRC (Anders and others, 2001). This review provides a critique of previous aquatic foodbase activities conducted by GMCRC staff and cooperators and make recommendations for future research directions. One recommendation of the PEP review (2001) that all proposals should closely follow is: “the best approach [for understanding linkages between lower trophic levels and fish in the CRE] is likely a fully integrated one, utilizing data on the abundance of prey available to fish in the [CRE], the apparent food habits as indicated by stomach content analysis, and indicators from the fish themselves, including isotopes, growth and condition, and body composition.”

The activities of GMCRC and the Bureau of Reclamation’s Glen Canyon Environmental Studies program, the predecessor to GMCRC, have been the subject of four different National Research Council reviews (NRC 1991; NRC 1996; NRC 1997; NRC 1999). These reviews have all criticized the lack of meaningful integration among the GMCRC Physical, Biological, and Cultural Science programs. The lack of integration, particularly among the Physical and Biological programs, has hindered our ability to understand how dam operations affect the Colorado River ecosystem in general, and the specific factors that control the distribution and abundance of primary producers and consumers. Respondents to this solicitation must present an integrated plan of research and should consult the report by Meretsky and Melis (1997) for a summary of important, and potentially fruitful, avenues for integration.

Proposals must, at a minimum, address the following objectives:

1. Present a conceptual model that identifies potential variables that control the standing mass or productivity of lower trophic levels, and linkages among lower trophic levels and fish, that is then used to frame and prioritize integrated research plans.
2. Identify trophic pathways that are of importance to Humpback Chub and Trout in Glen Canyon, Marble Canyon, and Grand Canyon.
3. Determine the feeding habits of Humpback Chub and Trout in Glen Canyon, Marble Canyon, and Grand Canyon.
4. Determine the origins of organic matter that contribute significantly to secondary production.
5. Based on findings from objectives 1-3, develop monitoring protocols that can accurately estimate food availability for fish in the CRE.
6. A contingency plan for releases above peak-power plant capacity that details how these releases will affect the proposed research, and a research plan for assessing the potential impacts of these releases on the aquatic foodbase.

GCMRC Involvement in Research

The USGS scientists at the GMCRC, under the rules laid out in the Federal Grant and Cooperative Agreement Act of 1977, will have ‘substantial involvement’ in all aspects of this project. The GMCRC Aquatic Ecologist (Theodore Kennedy) has expertise in community and food web ecology, trophic linkages, stable isotope methods, whole stream metabolism measurements, organic matter dynamics, and terrestrial—aquatic linkages and will collaborate

with the Project Team on all aspects of this project including planning, field work, data analysis and interpretation, and the publication of research results in peer-reviewed journals. Specifically, Kennedy will spend up to 30% of his time devoted to fulfilling the objectives of the Cooperative Agreement. GCMRC scientists also have extensive experience and expertise in fisheries research and monitoring, hydrology, water quality, sediment transport and river morphology, terrestrial ecology, etc., and will be available to provide guidance and advice to the project team during all phases of this project. See also Federal Involvement Statements 1 & 2, below, for information on additional areas of GCMRC involvement in the Cooperative Agreement.

Project Schedule and Deliverables

The project will be funded for FY 2005 with the possibility of extension for two additional years, contingent on funding and adequate progress towards project objectives. Anticipated funding is \$100,000-\$200,000 annually. Logistical support for 4-6 river trips per year have been built into the project budget. Respondents to this solicitation should develop their budget and research plan based on the upper estimate of funding (\$200,000 annually, with logistical costs covered by GCMRC), realizing that plans may have to be altered as the annual funding level becomes known. As stated above, the proposal and the data collection schedule should be developed in such a manner to adequately address the objectives included in this request.

Annual progress reports on the status of the project, and trip reports describing the accomplishments of each river trip that is conducted as part of the project, must be delivered to the GCMRC as per Attachment 9 of this Program Announcement. These reports are intended to keep GCMRC program managers informed of project progress, problems, or unforeseen needs associated with project activities. A draft final report should be submitted three months prior to the end of the Cooperative Agreement period and a final report by termination of the Cooperative Agreement. The final report shall contain an executive summary suitable for dissemination to management entities.

To the extent feasible, data resulting from this project must be compatible with existing data and/or data collected under other projects, as appropriate. Data bases shall be delivered at the close of the Cooperative Agreement or made electronically accessible to the GCMRC in an appropriate format as specified in Appendix 9 of this Program Announcement.

In keeping with its mission of information dissemination to stakeholders and other members of the public, the GCMRC anticipates that all researchers will make 2-3 presentations as requested by the GCMRC, and will publish project results and data in appropriate peer-reviewed journals and volumes, subject to government data protocols and restrictions on sensitive information. A copy of all publications shall be submitted to GCMRC.

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Federal Involvement Statement #1

Support Provided by GCMRC

Logistics

River Trips

The Grand Canyon National Park (GRCA) regulates the operational use and access of commercial, private and research groups in Glen, Marble and Grand Canyons. GRCA requires that research trips be in compliance with the rules and regulations established in the applicable Code of Federal Regulations and NPS policies. Therefore, all researchers need to obtain all appropriate research and collecting and river trip permits. PIs are responsible for obtaining their own research collecting permits from GRCA. River trip permits are coordinated through GCMRC. Please see Appendix 7 for an overview of the permitting process.

The GCMRC shall be solely responsible for all logistical planning, coordination and operations associated with its monitoring and research activities on the Colorado River in Glen, Marble and Grand Canyons. The role of the GCMRC will be to provide for all of the necessary logistical equipment (vehicles, boats, etc.) selected technical equipment (single-beam hydrographic, netting and electro-fishing boats, etc.), logistical supplies (food, gas, etc.) and support (boat operators, shuttle drivers, etc.).

The GCMRC has designated a Logistical Coordinator to be responsible for coordinating logistics of all research activities and has established procedures for scheduling research trips. Workshops are provided to all PIs in October and November to evaluate and plan each PI's logistical needs. Additional workshops may be scheduled if needed. GCMRC requires that all principal investigators (PI) request and submit a river Trip Request Form to the Logistical Coordinator at least 60 days in advance of the planned research trip

Surveying

The survey department provides support for spatial measurement and referencing of scientific data collected in the study area by GCMRC scientists and co-operators. Support is provided for geographic referencing of sample locations, production of high-resolution topographic maps and cross-sections, digital elevation models, and bathymetry. The survey department is also responsible for establishing and maintaining accurate geographic control in the Canyon. Canyon control is essential for accurate geo-referencing of remotely sensed data and spatial analysis of resource data using modern image processing and GIS technologies. These technologies are critical to the integration and analysis of the diverse scientific data that have been collected in the Canyon over the past 23 years. GCMRC data standards require geo-referencing of all data collected in the Canyon.

Terrestrial surveying support and equipment are available to GCMRC co-operators for whom surveying is necessary to fulfill project objectives specified in this solicitation. Hydrographic survey support is available to all co-operators requiring bathymetry to fulfill project objectives specified in this solicitation. GCMRC's obligation is limited to providing electronic point data and modeled surfaces to co-operators using GCMRC defined data formats. Co-operators are expected to perform any format conversions and additional analysis necessary to fulfill their agreement obligations.

Survey personnel, expertise, or equipment will be allocated based upon project requirements and availability of staff and equipment. GCMRC maintains the right to allocate personnel, expertise, and equipment in a manner it deems necessary to satisfy all survey

requirements. This may require some co-operators to perform surveying operations themselves. GCMRC will provide training and assistance to the extent possible if this occurs. Co-operators are financially responsible for any equipment rental costs and for replacing lost or damaged equipment.

All survey data collected by co-operators is subject to GCMRC review of quality, methodologies, conformance to data standards, and experience level of those collecting the data before acceptance. Questions regarding survey services should be addressed to Keith Kohl at (928) 556-7371 or kkhol@usgs.gov.

Data Acquisition Storage and Analysis

The GCMRC Data Acquisition, Storage and Analysis (DASA) team provides support to GCMRC co-operators doing research in the Colorado River ecosystem in the areas of remote sensing, geographic information systems (GIS), and database management systems. The support ranges from the collection of aerial imagery and other remote sensing technologies to the storage, integration, analysis, and access electronic tabular and spatial data.

Electronic version of reports and spatial data sets are viewable via the GCMRC web site (<http://www.gcmrc.gov/products/products.htm>). The Internet Map Server link provides viewable links to most current spatial data sets throughout the CRE. Historical flow and stage discharge data are downloadable for various gage locations including Glen Canyon Dam via the Flow and Elevation Data link. Data available from the GCMRC web site vary in quality and completeness. It is the responsibility of the co-operator to determine the suitability of any data utilized from GCMRC data sources in satisfying their agreement/contract obligations. Requests for DASA program support needs to be included as part of the technical proposal package submitted for review and must include the appropriate completed request form (Attachments 8). DASA support for each program area is described below.

Remote Sensing

Several sets of high resolution black and white or color infrared aerial photography of the Colorado River corridor between Glen Canyon Dam and the headwaters of Lake Mead have been collected. A list of all catalogued imagery is available from the GCMRC web site (http://www.gcmrc.gov/news_info/galleries/default.htm). Copies of some of this imagery are available to cooperators for use in the field. The format of the imagery will be either hard copy contact prints available from our library or digital tiff image files available for download from the GCMRC ftp site.

GIS Support

The GCMRC GIS program provides topography, imagery, and other miscellaneous spatial base data to GCMRC co-operators conducting scientific investigations on the Colorado River ecosystem (see Attachment 8). Spatial data of the study area are available in Arc/Info export format at various scales, resolutions and times. Orthorectified and non-orthorectified black & white and color infrared digital imagery are available in tiff and Mr. SID formats at various scales, resolutions and times. Metadata for each file is provided where available. Data is organized by its geographic location and the time it was collected. README files are available that define the file structure and naming conventions used throughout the site.

Co-operators are responsible for having sufficient computing resources, Internet bandwidth, and GIS expertise to utilize data. GCMRC does not produce maps, collect or analyze data, or produce other GIS products for co-operators other than what is specified in the specific Program Announcement. GCMRC will provide a limited amount of data (up to 4.5 gigabytes) on CD-ROM or DVD in cases where the amount of data needed to meet obligations exceeds the Internet's ability to efficiently transmit the data. Co-operators must fill out the Data Request Form (see Attachment 8) to receive the data in this manner. Data requests greater than 4.5 gigabytes may require the co-operator to copy the data themselves on-site using GCMRC CD-ROM or DVD copy facilities. Co-operators may be required to provide media to utilize these facilities. Questions regarding GIS data should be addressed to Tom Gushue at (928) 556-7370 or tgushue@usgs.gov.

Library Services

The GCMRC library supports co-operators investigating the Colorado River ecosystem by providing access to current and historical hard copy and digital information such as reports, maps, aerial photography, slides, and videos. Many items are available in pdf format from the GCMRC Library Database (<http://www.gcmrc.gov/products/products.htm>). Hardcopies of reports and aerial photographs may be borrowed from the library for up to three weeks. Videotapes, slides, and photos may only be viewed on-site. Materials from the library cannot be taken into the field. Co-operators are responsible for replacing lost or damaged items loaned to them.

Requests for materials should be directed to Stephanie Wyse in person, by phone (928 556-7373), or via e-mail (swyse@usgs.gov). GCMRC will strive to fulfill library requests from out-of-town within ten business days of receipt of the request. Co-operators are responsible for making their own copies during that time for long term or field use and then returning the borrowed item(s) prepaid.

It is anticipated that, in many cases, co-operators will come on site to research materials. The library can provide a photocopier to duplicate non-copyrighted materials as well as equipment to view videos, CD-ROM's and DVD's. Facilities are also provided for copying digital information onto CD-ROM and DVD. PI's may be required to provide media to utilize these facilities.

Library users are encouraged to use the online Library Database (<http://www.gcmrc.gov/products/products.htm>). Users can search for hard copy/pdfs of reports, books, and publications by title, author, keyword, etc. A catalog of aerial photography is also available in pdf format. Questions may be referred to Stephanie Wyse at (928) 556-7373 or swyse@usgs.gov.

Federal Involvement Statement #2

Contingency Plan Background

The Technical Work Group (TWG), technical representatives of the AMWG, and AMWG have adopted hydrologic criteria and resource criteria for triggering releases above peak power-plant capacity from Glen Canyon Dam (such as Beach/Habitat-Building Flows). When triggered, these criteria provide little lead time for monitoring and research planning. In

addition, hydrologic conditions can lead to unplanned release events which will also require GCMRC to implement monitoring and research activities with little to no lead time. The potential for these events to occur result in the need for contingency planning. Annually, GCMRC will develop contingency plans for implementation of:

- (1) supplemental monitoring before and (or) after unplanned events, as appropriate;
- (2) research assessments of flows above peak power-plant capacity (as per the GCDEIS) or other short-duration high flow unplanned events; and
- (3) a supplemental monitoring and research program for planned events between January-July of a given year.

Funding to support monitoring and research activities beyond those which constitute annual planned activities (described in the FY 2005 Annual Work Plan) will be sought from the U.S. Geological Survey and the Western Area Power Administration subject to the recommendation of the AMWG/TWG.

Co-operator Contingency Plan

The Record of Decision (ROD) and the Glen Canyon Dam Environmental Impact Statement recognize that unscheduled water releases from GCD may be necessitated by high water levels within Lake Powell. For example, in February 1997, unscheduled high water releases (27,000 cfs) occurred on short notice due to these conditions. In addition, spring/summer 2000 steady releases (8,000 cfs) were implemented as a special test release for studying native, endangered fishes.

Given the potential for unscheduled releases in the future, as well as the possibility for short lead times with regard to scheduling additional experimental releases above peak power-plant capacity, proposals should provide a one to three page contingency plan. Contingency plans should address how the proposed research and/or monitoring activities would need to be modified (e.g., different monitoring or research protocols, different equipment, additional costs, safety concerns, etc.) in the event that water release levels exceed 25,000 cfs, are held to special constant levels, or are specifically designed to achieve special test-flow objectives within the annual funding period. The contingency plan will be evaluated as part of the Technical Proposal.

SECTION D. INSTRUCTIONS FOR SUBMITTING

Application for Federal Assistance

Application Preparation Instructions

All applications must include the following information:

- Title
- Project summary (1 page, not included in the 20 page limitation)
- Name, affiliation, and contact information (phone, fax, mail, e-mail) of person(s) submitting the proposal
- Name and contact information of person to contact regarding technical issues or questions (if different from submitter)
- Project cost and duration

In addition to those requirements, the applicant shall also:

- Print or type PI's name on each page of the application.
- Initial erasures or other changes by the person signing the application.
- Sign the application. Applications signed by an agent shall be accompanied by evidence of that agent's authority.
- Designate a person who will be in charge of the agreement administration and provide name, title, address, telephone, and fax number of designee.
- Submit an original and **eight (8)** copies of the full application, including all Federal forms, additional information and attachments.
- Applications shall be submitted in sealed envelopes or packages and be clearly labeled: "Application for Federal Assistance for GCMRC Aquatic Foodbase Research Activities."

Applications must:

1. Describe the conceptual basis and objective(s) for the project.
2. Describe the proposed methodologies.
3. Describe expected results/products to be generated from the project and how this information will directly apply to improving management of the Colorado River ecosystem.
4. Describe qualifications of PI(s) and institutional resources.
5. Describe anticipated partnerships and identify the roles of partners.
6. Provide a summary and detailed budget for the entire project.
7. Indicate the anticipated duration of the project with starting and ending dates of the project and submission of final products.
8. Describe a contingency plan for data gathering, if needed, in the event of unscheduled high or low flows.
9. Describe applications / integration of this project with other GCMRC program areas, if any.
10. Include references to the literature and Internet Web sites, as appropriate.

Format

Conformance to the following instructions is required. Particular attention is given to length, content and formatting, including the page limit on the technical proposal and other application sections, use of appendices and required format for biographical sketches. Applications must be stapled in the upper left-hand corner, but otherwise unbound, and have 1 inch margins at the top, bottom and on each side. The type size must be clear and readily legible. No smaller than 12 point font size will be accepted. Line spacing (single-spaced, double-spaced, etc.) is at the discretion of the applicant; however, established page limits must be followed. The original signed copy should be printed only on one side of each sheet. Additional copies of the application must be printed on one side only.

Applications must conform to the specified format and include the required elements and may not exceed 20 single-spaced 8.5" X 11" pages in length, with fonts no smaller than 12 point. Federally mandated forms are not included within the 20-page limitation.

Required Elements

The Application for Federal Assistance shall contain, in the following order:

1. **Cover Sheet / Application for Federal Assistance**—Use Standard Form 424, which is Attachment 2 to this document, or download the form from the following website: http://www.whitehouse.gov/OMB/grants/grants_forms.html
2. **Project Summary/Abstract**—The technical proposal must contain a brief description of the proposed activity that is suitable for publication and not more than one page in length. It should be a self-contained description (i.e., who, what, when, where, why, and how) of the activity that would result if the proposal were funded. The summary should be written in the third person and include a justification for the proposed project in relation to current scientific understanding, statement of objectives, methods to be employed, potential applicability of the anticipated results, and significance of the proposed activity to the advancement of knowledge. It should be informative to other persons working in the same or related fields and, insofar as possible, understandable to a scientifically or technically literate lay reader. (Note: Not to exceed one 8.5" x 11" typewritten page. **This will NOT be considered part of the 20-page limitation.**)
3. **Project Description**—Material that counts as part of the **20-page** limitation of the technical proposal and should include, in the order listed below, the following elements.
 - a) **Introduction/Justification**—A clear statement of the work to be undertaken explaining the conceptual basis, objectives and significance of the project.
 - b) **Objectives**—The specific study objectives and/or hypotheses to be tested

or questions/problems to be addressed by the proposed work, scientific or technical issues that underlie the proposed activity, including available relevant findings, related ongoing activities, and the scientific and practical value of the anticipated results.

- c) **Background**—Brief review of pertinent published and unpublished information relevant to the proposed activity.
- d) **Methods**—This statement should outline the general plan of work including the proposed methods to accomplish the project. Describe the procedures and methods to be followed in sufficient detail to permit evaluation of likely success. For example, if vegetative community analysis is to be done, the applicant needs to clearly identify how community constituents will be determined and the method used to determine the community classification. If applicable, the following topics should be addressed: procedures for testing of hypotheses or developing models, methods for sampling or surveying, quality assurance and control procedures, statistical analysis, data management and ability to meet GCMRC data standards, spatial analysis, etc. If standard methods are to be used, a reference for the methods is sufficient. Plans for documentation and sharing of data, physical sample collection storage and other appropriate research product disposition should be specified and described so as to meet GCMRC standards.
- e) **Facilities/Equipment/Study Areas/Logistics**—Describe facilities, equipment, and study areas to be utilized in the project. A logistics plan that identifies anticipated river trips or helicopter usage and includes the following: number of trips to be scheduled, estimated date or time of year, duration (river days), number of people, type of boats (motor, oar) to be used and equipment you would be taking downstream.
- f) **Expected results/products**—Describe expected products to be generated from the project (e.g., written reports, new monitoring protocols, workshops, scientific publications, maps, data/metadata, etc.).

Note: Visual materials, including charts, graphs, maps, photographs and other pictorial presentations ARE INCLUDED in the 20-page limit.

- 4. **Additional Information**—The following must be included in order for the application to be considered, **but is NOT counted against the 20-page limitation for proposals.**

- a) **References Cited**—Citations must be complete (including name of authors, title and location in the literature).

- b) **Results from Prior GCMRC Support**—If the PI(s) has received GCMRC funding in the past five years, information on the prior award is required. If the applicant has received more than one prior award (amendments to an award are not considered separate awards), the applicant should provide the information requested for the award most closely related this effort. The following information should be provided:
1. The GCMRC Agreement or Contract number, amount and period of support;
 2. The title of the project;
 3. Summary of the results of the completed work;
 4. Publications resulting from the effort;
 5. Brief description of available data, samples, physical collections and other related research products not described elsewhere; and if the proposal is for renewed support, a description of the relation of the completed work to the proposed work.

Reviewers will be asked to comment on the quality of the prior work described in this section of the proposal. Please note that a PI with prior support may use up to two single-spaced pages to describe the results.

These will be considered an attachment to the proposal and NOT considered part of the page limitation.

- c) **Personnel/Qualifications**—(1) List project personnel and their respective roles and responsibilities. Proposals should also indicate whether students will be participating in the research. (2) Biographical sketches - summarize the qualifications of each principal investigator and co-investigator making significant contributions to the success of the proposed project. Include training, relevant work experience, accomplishments, and up to five publications most closely related to proposed activities. (NOTE: Biographical sketches are limited to two 8.5" X 11" type-written pages and should be submitted for each principal, co-investigator and cooperator/partner making significant contributions to the completion of the proposed project. **These will be considered an attachment to the technical proposal and NOT considered part of the 20-page limitation.**)

- d) **Cooperators/Partners**—Indicate all cooperators or partners making significant contributions to the success of the proposed project. Include names, addresses, affiliations, and phone and fax numbers. Provide brief summaries of their respective roles, and types of contributions (e.g. financial, in-kind, technical) toward project objectives. Provide a letter from all listed cooperators or partners indicating their commitment to the proposed project. **These will be considered an attachment to the technical proposal and NOT considered part of the 20-page limitation.**)

- e) **Information Transfer/Data Archiving**—Identify intended users of project results/products and describe a plan for making the results/products available for application. Describe data verification methods used to ensure accuracy of data provided in electronic form. Explain how projects will make metadata/data, and/or information and products accessible. Include statement of agreement to have the GCMRC archive all developed data and in what format (ASCII, hardcopy, binary etc.) these data will be delivered. **This narrative should be limited to no more than one page and will NOT be considered part of the 20-page limitation** (See Attachment 9 for details on data standards, archiving, etc.)
 - f) **Work and Reporting Schedule**—Provide a timetable for achievement of milestones and completion of the project. Indicate the date of submission of interim and final written reports and products. **These will be considered an attachment to the technical proposal and NOT considered part of the 20-page limitation.**
 - g) **Legal and Policy-Sensitive Aspects**—Address any issues related to legal or policy mandates. Include any necessity for State or Federal permits. **This narrative should be limited to one page and will NOT be considered part of the 20-page limitation** (see the “Application guidelines for Research and Collecting Permits” for information on relevant GRCA guidelines).
 - h) **Current and Pending Support**—Complete the GCMRC standard form (Attachment 4).
5. **Contingency Plan in Response to the Federal Involvement Statement Located With the Government’s Program Description in Section C**—Provide a 2-3 page narrative that describes how the proposed monitoring/research activities would need to be modified in the event of any specially designed flows outside of normal operations during the project period. Please indicate any associated budget changes. **This will be considered an attachment to the proposal and NOT considered part of the 20-page limitation.**
6. **Summary and Detailed Budget**—Use Standard Form 424A, which is Attachment 3 to this document or download the form from the following website: http://www.whitehouse.gov/OMB/grants/grants_forms.html. Submit your budget for this project broken down by the 3 Annual Funding Periods that are anticipated for this project. Include the following:
- a) **Salaries and Wages:** Identify individuals or categories of personnel assigned to the project; estimate hours, or percent of time to be worked by each, and rate of compensation proposed for each.

- b) Indirect Cost Rates: Propose the overhead rates to be charged. Explain what costs are covered in this category and the basis of the rate completion. Indicate whether the rates are to be used for application purposes only, or whether they are fixed or provisional rates for billing purposes.
 - c) Travel: State the purpose of each trip and itemize the estimated travel costs. State the number of trips required, destination, number of people traveling, per diem rates, cost of transportation, and miscellaneous expense for the trip(s).
 - d) Other Direct Costs: Itemize costs not included elsewhere, such as equipment, supplies, computer charges, etc. Where appropriate, provide breakdowns showing how the cost was estimated.
7. **Assurances**—Use Standard Form 424B, which is Attachment 5 to this document or download the form from the following website:
http://www.whitehouse.gov/OMB/grants/grants_forms.html
8. **Certifications**—Use Form DI-2010, which is Attachment 6 to this document, or download the form from the following website:
<http://www.doi.gov/nbc/formsmgt/forms/di2010.pdf>
9. **Disclosure of Lobbying Activities**—Use SF LLL, which is Attachment 11 to this document, or download the form from the following website:
<http://www.whitehouse.gov/omb/grants/sflllin.pdf>
10. **Attachments to the Application**—Your application must include the following completed form, which is attached to this Announcement:
- Attachment 8 – Data Request Form
11. **Attachments to the Final Agreement**—The following attachments should be reviewed during the preparation of your proposal. You will need to be able to agree to the terms and conditions in these documents prior to finalizing any agreement.

Attachment 9—Required Data Format and Standards and Reports Preparation. This form is not required to be attached to the Proposal, but will be incorporated in any resulting agreement.

Restriction on Disclosure and Use of Data

Those who include data that they do not want disclosed to the public must do the following:

- (a) Mark the title page with the following legend: "This proposal includes data that shall not be disclosed outside the Government and shall not be duplicated, used, or disclosed—in whole or in part—for any purpose other than to evaluate this proposal or quotation. If, however, an agreement is awarded to this offeror or quoter as a result of—or in connection with—the submission of this data, the Government shall have the right to duplicate, use or disclose the data to the extent provided in the resulting agreement. This restriction does not limit the Government's right to use information contained in this data if it is obtained from another source without restriction. The data subject to this restriction are contained in sheets [insert numbers or other identification of sheets]"; and
- (b) Mark each sheet of data you wish to restrict with the following legend: "Use or disclosure of data contained on this sheet is subject to the restriction on the title page of this proposal or quotation."

Special Terms and Conditions

The following items will be incorporated into any cooperative agreement resulting from this solicitation and the fill-ins will be completed at the time of award.

1. PAYMENT

- (a) Method of Payment: The U. S. Geological Survey (USGS) is using the Health and Human Services (HHS) Payment Management System (PMS) to provide electronic invoicing and payment for assistance award recipients. The Recipient has established or will establish an account with PMS with the award of each grant/cooperative agreement; a sub-account will be set up from which the Recipient can draw down funds. The sub-account number will be shown in block 4 of the face page of each award or modification.

Payments will be made available through PMS. The PMS is administered by the Department of Health and Human Services (DHHS), Division of Payment Management of the Financial Management Service, Program Support Center. The DHHS will forward instructions for obtaining payments to the recipients. Inquiries regarding payment should be directed to:

Division of Payment Management
Department of Health and Human Services
P. O. Box 6021
Rockville, M.D.

The Division of Payment Management web address is www.dpm.psc.gov. Problems or questions with electronic draw down procedures should be directed to Tonja Thomas at (301) 443-9141 or Nancy Weigner at (301) 443-9240.

(b) Financial Reporting Requirements

- (1) STANDARD FORM 269, FINANCIAL STATUS REPORT (original and 1 copy): Report required no less than annually. A final report is required no later than 90 days after completion of the cooperative agreement.
- (2) STANDARD FORM 272, FEDERAL CASH TRANSACTIONS REPORT. Although payments are made through PMS, a copy of an SF-272 is required to be sent to the Contracting Office for monitoring purposes.

2. LEVEL OF EFFORT

- (a) (1) Key Personnel. The personnel named in paragraph (a)(2) below are hereby identified as key personnel and are considered essential to the work being performed hereunder. Should any of the specified individual(s) be diverted to other programs, the Recipient shall notify the Contracting Officer reasonably in advance and shall submit justification, including proposed substitutions, in sufficient detail to permit evaluation of the impact to the program. No diversion shall be made by the Recipient without written consent of the Contracting Officer; however, the Contracting Officer may ratify in writing such diversion and such ratification shall constitute the consent of the Contracting Officer required by this clause. The list of personnel set forth in paragraph (a)(2) of this provision may be amended from time to time during the course of the agreement to either add or delete personnel, as appropriate.

(2) List of Key Personnel

Name and Title

Level of Effort

- (b) It is understood and agreed that pursuit of the technical objectives may necessitate use of labor categories in amounts varying from that shown in the Recipient's proposal. If found to be necessary for more successful or efficient performance of work, the Recipient

may reduce the effort used in any category other than key personnel and apply the savings to any other scientific or technical direct labor category or to key personnel. Nothing in this part shall be construed as authorizing expenditures in excess of the total estimated cost of the agreement.

3. ADHERENCE TO ORIGINAL OBJECTIVE AND BUDGET ESTIMATES

- (a) Any commitments or expenditures incurred by the Recipient in excess of the funds provided by this award shall be the responsibility of the Recipient. Expenditures incurred prior to the effective date of this award cannot be charged against award funds unless provided for in this award.
- (b) Submit any proposed change requiring written approval of the USGS 30 days prior to the requested effective date of the proposed change.
- (c) (1) The following expenditures require advance written approval by the Contracting Officer.
 - (A) Changes in the scope, objective, or key personnel referenced in the Recipient's proposal.
 - (B) Absences of the Principal Investigator (PI) for more than three months, or reduction in PI's time devoted to the project by more than 25%.
 - (C) The need for additional Federal funding.
 - (D) Transfer of funds allotted for training allowances (direct payment to trainees) to other categories of expenses.
 - (E) The subaward transfer or contracting out of any work under this award, unless described in the application and funded in the approved award. This provision does not apply to the purchase of supplies, material, equipment, or general support services.
- (2) The Recipient shall submit a revised financial estimate and plan for (A) through (E) above.

4. BUY AMERICAN ACT NOTICE. Pursuant to Sec. 307(b) of the Department of the Interior portion of the Consolidated and Emergency

Appropriations Act, 1999, Public Law 106-277, please be advised of the following:

In case of any equipment or product that may be authorized to be purchased with financial assistance provided using funds made available in this Act, it is the sense of the Congress that entities receiving the assistance should, in expending the assistance, purchase only American-made equipment and products.

5. METRIC CONVERSION. All progress and final reports, other reports, or publications produced under this award shall employ the metric system of measurements to the maximum extent practicable. Both metric and inch-pound units (dual units) may be used if necessary during any transition period(s). However, the recipient may use non-metric measurements to the extent the recipient has supporting documentation that the use of metric measurements is impracticable or is likely to cause significant inefficiencies or loss of markets to the recipient, such as when foreign competitors are producing competing products in non-metric units.
6. ANTI-LOBBYING CLAUSE: The Recipient shall not use any part of the appropriated funds from the Department of Interior portion of the Omnibus Consolidated and Emergency Supplemental Appropriations Act, 2000, for any activity or the publication or disruption of literature that in any way tends to promote public support or opposition to any legislative proposal on which Congressional action is not complete.
7. INCREASING SEAT BELT USE IN THE UNITED STATES, EC 13043: Recipients of grants/cooperative agreements and/or sub-awards are encouraged to adopt and enforce on-the-job seat belt use policies and programs for their employees when operating company owned, rented, or personally owned vehicles. These measures include, but are not limited to, conducting education, awareness, and other appropriate programs for their employees about the importance of wearing seatbelts and the consequences of not wearing them.
8. ORDER OF PRECEDENCE. The cooperative agreement will consist of the following documents. In the event of any inconsistency between the provisions of this agreement, the inconsistency shall be resolved by giving precedence in the following order:
 - a. Cover Sheet of the Agreement;
 - b. The Special Terms and Conditions and Program Description contained herein;
 - c. Grant/Agreement General Provisions, incorporated by attachment hereto;
 - d. Recipient's Assurances incorporated by attachment hereto;

- e. Recipient's proposal incorporated by reference within the Agreement;
- f. Other documents or provisions which are attached to or incorporated by reference in the Agreement.

General Provisions

- a. The Recipient shall be subject to the following OMB Circulars/regulations and/or Federal Acquisition Regulations, as amended, which are incorporated herein by reference (copies of these Circulars can be obtained directly from the Internet at: www.whitehouse.gov/OMB, click on "circulars").

Educational Institutions

Circular No. A-21, Cost Principles for Educational Institutions.

Circular No. A-110, (Revised) Grants and Cooperative Agreements with Institutions of Higher Education, Hospitals, and other Non-profit Organizations.

Circular No. A-133, Audits of States, Local Governments and Non-Profit Organizations.

State and Local Governments

Circular No. A-87, Cost Principles for State, Local and Indian Tribal Governments.

Circular No. A-102, Grants and Cooperative Agreements With State and Local Governments.

Circular No. A-133, Audits of States, Local Governments and Non-Profit Organizations.

Non-Profit Organizations

Circular No. A-110, (Revised) Grants and Cooperative Agreements with Institutions of Higher Education, Hospitals, and other Non-profit Organizations.

Circular A-122, Cost Principles for Non-Profit Organizations, and

Circular No. A-133, dated 06/24/97, Audits of States, Local Governments and Non-Profit Organizations

Organizations for Profit

General administrative requirements will be in accordance with Federal Acquisition Regulations (FAR), subchapter E, Parts 29, 30, and 31; including principles for determining the allowability of costs in accordance with FAR, subchapter E, Part 31.2.

b. The following Code of Federal Regulations (CFR) are applicable to this Grant/Cooperative Agreement.

- (1) 43 CRR Part 12, Subpart A: Administrative and Audit Requirements and Cost Principles for Assistance Programs
- (1) 43 CFR Part 12 Subpart D, Debarment and Suspension, (Nonprocurement) and Government-wide Requirements for Drug Free Workplace.
- (2) 43 CFR Part 12 Subpart E, Buy American Requirements for Assistance Programs.
- (3) 43 CFR Part 17, Subpart A: Nondiscrimination on the Basis of Race, Color, or National Origin
- (4) 43 CFR Part 17, Subpart B: Nondiscrimination on the Basis of Handicap
- (5) 43 CFR Part 18: New Restrictions on Lobbying

c. The following COI Code of Federal Regulations (CFR) are hereby invoked in this Grant/Cooperative Agreement as applicable.

- (1) 43 CFR Part 12, Subpart C: Uniform Administrative Requirements For Grants and Cooperative Agreements to State and Local Governments
- (2) 43 CFR 12, Subpart F: Uniform Administrative Requirements for Grants and Cooperative Agreements with Institutions of Higher education, Hospitals, and Other Non-Profit Organizations

Recipient shall not publicize or otherwise circulate, promotional material (such as advertisements, sales brochures, press releases, speeches, still and motion pictures, articles, manuscripts or other publications) which states or implies governmental, Departmental, bureau, or government employee endorsement of a product, service, or position which the recipient represents. No release of information relating to this award may state or imply that the

Government approves of the recipient's work products, or considers the recipient's work product to be superior to other products or services.

All information submitted for publication or other public releases or information regarding this project shall carry the following disclaimer:

“The views and conclusions contained in this document are those of the authors and should not be interpreted as representing the opinions or policies of the U. S. Government. Mention of trade names or commercial products does not constitute their endorsement by the U.S. Government.”

Recipient must obtain prior Government approval for any public information releases concerning this award which refer to the Department of the Interior or any bureau or employee (by name or title). The specific text, layout photographs, etc. of the proposed release must be submitted with the request for approval.

A recipient further agrees to include this provision in a subaward to any subrecipient, except for a subaward to a State government, a local government, or to a federally recognized Indian tribal government.

SECTION E. EVALUATION FACTORS FOR AWARD

Introduction

Applications will be reviewed for administrative compliance and then will be assigned to the appropriate GCMRC Program Manager for scientific review. All proposals will be carefully reviewed by a Program Manager, and by an independent peer review panel composed of experts from outside GCMRC, who are knowledgeable about the particular fields represented by the proposal, before recommending final action on proposals.

The sample proposal evaluation form, shown in Attachment 10, will be used for this review process.

Evaluation Factors

The following criteria will be applied to all technical proposals in accordance with the objectives and content of each technical proposal.

- (1) Relevance of the monitoring/research—The likelihood that the research can contribute to better understanding or improvement of the research, monitoring and management of the Colorado River ecosystem.
- (2) Scientific merit/technical innovation—The likelihood that the proposed project will lead to new discoveries or fundamental advances in scientific understanding with regard to the programmatic goals and objectives of the GCMRC; promote technical advances in the subject area; provide resource management alternatives not presently available; and improve understanding of the linkages between resources.
- (3) Technical feasibility—The likelihood that the technical approach is adequate to achieve the objectives identified; the proposed methods are appropriate and scientifically valid; the proposed schedule is realistic.
- (4) Research performance/competence—The capability of the PI(s) to accomplish the proposed activities; the adequacy of the institutional resources available, and evidence from the PI(s) past performance of their ability to meet the proposed project objectives and schedule.
- (5) Reasonableness of proposed budget—Sufficient information to evaluate if the proposed budget is reasonable and realistic for accomplishing the tasks identified.
- (6) Information transfer—Demonstration that the project will implement and enhance information dissemination and sharing, and that the PI(s) agree to provide their data (as specified by the GCMRC in the Data Standards and Delivery Requirements) to the GCMRC for archiving.
- (7) Anticipated partnerships—An indication of anticipated partnerships /

linkages with other entities, such as other research facilities, universities, tribal groups, etc.

Award Recommendation

After scientific, technical and GCMRC Program Manager's review and consideration of appropriate factors, the GCMRC Program Manager recommends to the GCMRC Chief whether the proposal should be declined or supported. If the program recommendation is for award, then the recommendation goes to the USGS for processing and issuance of a grant, contract, cooperative, or other appropriate agreement.

Applicants are cautioned that only an appointed Contracting Officer in the USGS Branch of Acquisition and Federal Assistance office may make commitments, obligations or awards on behalf of the Government or authorize the expenditure of funds. This notice must be received in writing from the contracting officer before any obligation exists to the government.

Copies of Reviews

When a decision has been made (whether an award or a declination), verbatim copies of reviews (excluding the names of the reviewers) and summaries of review panel deliberations, if any, will be mailed to the PI(s)

SECTION F. ATTACHMENTS

List of Attachments

Attachment 1

CHECKLIST FOR PROPOSALS SUBMITTED TO USGS/GCMRC

Attachment 2

PROPOSAL / APPLICATION COVER PAGE: SF-424

Attachment 3

PROPOSAL / APPLICATION BUDGET: SF-424A

Attachment 4

CURRENT AND PENDING SUPPORT

Attachment 5

ASSURANCES: SF-424B

Attachment 6

CERTIFICATIONS: DI-2010

Attachment 7

**GCMRC PROTOCOLS FOR NPS PERMIT APPLICATION REVIEW AND
APPROVAL**

Attachment 8

DATA REQUEST FORM

Attachment 9

REQUIRED DATA FORMAT AND STANDARDS AND REPORTS PREPARATION

Attachment 10

PROPOSAL EVALUATION FORM

Attachment 11

STANDARD FORM (SF) LLL

Attachment 1

Checklist for Proposals Submitted to USGS/GCMRC

Technical Proposal that contains the following (Not to exceed **20** pages including visual materials, minimum 12 pt font, single sided, original and eight (8) copies.

- _____ **Cover Sheet - SF 424, Signed, Program Identified, Name & address of offeror provided**
(Attachment 2)
- _____ **Project Summary / Abstract**
- _____ **Project Description**
 - _____ **Introduction/Justification**
 - _____ **Objectives**
 - _____ **Background**
 - _____ **Methods**
 - _____ **Facilities/Equipment/Study Areas/Logistics**
 - _____ **Expected Results/Products**
- _____ **Additional information** (only material essential for proposal)
 - _____ **References Cited**
 - _____ **Results from Prior GCMRC Support**
 - _____ **Personnel/Qualifications**
 - _____ **Cooperators/Partners**
 - _____ **Information Transfer/Data Archiving**
 - _____ **Work and Reporting Schedule**
 - _____ **Legal and Policy-Sensitive Aspects**
 - _____ **Current and Pending Support** (Attachment 4)
- _____ **Contingency Plan** (1-3 pages)
- _____ **Summary and Detailed Budget - SF 424A** (Attachment 3)
- _____ **Assurances - SF 424B** (Attachment 5)
- _____ **Certifications – DI-2010** (Attachment 6)
- _____ **Disclosure of Lobbying Activities—SF LLL** (Attachment 11)
- _____ **Attachments to the Application**
 - _____ **Completed Data Request Form** (Attachment 8)
- _____ **Restriction on Disclosure and Use of Data**
- _____ **Original + Eight Copies of Above Materials**

Reviewed:

- _____ **Attachments to the Final Agreement**
 - _____ **GCMRC Protocols for NPS Permit Application Review and Approval** (Attachment 7)
 - _____ **Required Data Format, Standards and Report Preparation** (Attachment 9)
 - _____ **Sample Proposal Evaluation Form** (Attachment 10)
 - _____ **Special Terms and Conditions**

Attachment 2

Proposal / Application Cover Page: SF – 424

APPLICATION FOR FEDERAL ASSISTANCE

Version 7/03

1. TYPE OF SUBMISSION: Application <input type="checkbox"/> Construction <input checked="" type="checkbox"/> Non-Construction		2. DATE SUBMITTED 	Applicant Identifier
Pre-application <input type="checkbox"/> Construction <input type="checkbox"/> Non-Construction		3. DATE RECEIVED BY STATE 	State Application Identifier
		4. DATE RECEIVED BY FEDERAL AGENCY 	Federal Identifier

5. APPLICANT INFORMATION Legal Name:		Organizational Unit: Department:	
Organizational DUNS:		Division:	
Address: Street:		Name and telephone number of person to be contacted on matters involving this application (give area code) Prefix: First Name:	
City:		Middle Name	
County:		Last Name	
State:	Zip Code	Suffix:	
Country:		Email:	
6. EMPLOYER IDENTIFICATION NUMBER (EIN): -		Phone Number (give area code) Fax Number (give area code)	
8. TYPE OF APPLICATION: <input type="checkbox"/> New <input type="checkbox"/> Continuation <input type="checkbox"/> Revision If Revision, enter appropriate letter(s) in box(es) (See back of form for description of letters.) Other (specify)		7. TYPE OF APPLICANT: (See back of form for Application Types) Other (specify)	
10. CATALOG OF FEDERAL DOMESTIC ASSISTANCE NUMBER: TITLE (Name of Program): -		9. NAME OF FEDERAL AGENCY:	
12. AREAS AFFECTED BY PROJECT (Cities, Counties, States, etc.):		11. DESCRIPTIVE TITLE OF APPLICANT'S PROJECT:	
13. PROPOSED PROJECT Start Date: Ending Date:		14. CONGRESSIONAL DISTRICTS OF: a. Applicant b. Project	
15. ESTIMATED FUNDING:		16. IS APPLICATION SUBJECT TO REVIEW BY STATE EXECUTIVE ORDER 12372 PROCESS?	
a. Federal	\$	a. Yes. <input type="checkbox"/> THIS PREAPPLICATION/APPLICATION WAS MADE AVAILABLE TO THE STATE EXECUTIVE ORDER 12372 PROCESS FOR REVIEW ON DATE:	
b. Applicant	\$	b. No. <input checked="" type="checkbox"/> PROGRAM IS NOT COVERED BY E. O. 12372	
c. State	\$	<input type="checkbox"/> OR PROGRAM HAS NOT BEEN SELECTED BY STATE FOR REVIEW	
d. Local	\$	17. IS THE APPLICANT DELINQUENT ON ANY FEDERAL DEBT?	
e. Other	\$	<input type="checkbox"/> Yes If "Yes" attach an explanation. <input type="checkbox"/> No	
f. Program Income	\$		
g. TOTAL	\$		

18. TO THE BEST OF MY KNOWLEDGE AND BELIEF, ALL DATA IN THIS APPLICATION/PREAPPLICATION ARE TRUE AND CORRECT. THE DOCUMENT HAS BEEN DULY AUTHORIZED BY THE GOVERNING BODY OF THE APPLICANT AND THE APPLICANT WILL COMPLY WITH THE ATTACHED ASSURANCES IF THE ASSISTANCE IS AWARDED.			
a. Authorized Representative			
Prefix	First Name	Middle Name	Suffix
Last Name		c. Telephone Number (give area code)	
b. Title		e. Date Signed	
d. Signature of Authorized Representative			

Previous Edition Usable
Authorized for Local Reproduction

Standard Form 424 (Rev.9-2003)
Prescribed by OMB Circular A-102

Reset Form

INSTRUCTIONS FOR THE SF-424

Public reporting burden for this collection of information is estimated to average 45 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Budget, Paperwork Reduction Project (0348-0043), Washington, DC 20503.

PLEASE DO NOT RETURN YOUR COMPLETED FORM TO THE OFFICE OF MANAGEMENT AND BUDGET. SEND IT TO THE ADDRESS PROVIDED BY THE SPONSORING AGENCY.

This is a standard form used by applicants as a required face sheet for pre-applications and applications submitted for Federal assistance. It will be used by Federal agencies to obtain applicant certification that States which have established a review and comment procedure in response to Executive Order 12372 and have selected the program to be included in their process, have been given an opportunity to review the applicant's submission.

Item:	Entry:	Item:	Entry:
1.	Select Type of Submission.	11.	Enter a brief descriptive title of the project. If more than one program is involved, you should append an explanation on a separate sheet. If appropriate (e.g., construction or real property projects), attach a map showing project location. For preapplications, use a separate sheet to provide a summary description of this project.
2.	Date application submitted to Federal agency (or State if applicable) and applicant's control number (if applicable).	12.	List only the largest political entities affected (e.g., State, counties, cities).
3.	State use only (if applicable).	13.	Enter the proposed start date and end date of the project.
4.	Enter Date Received by Federal Agency Federal identifier number: If this application is a continuation or revision to an existing award, enter the present Federal Identifier number. If for a new project, leave blank.	14.	List the applicant's Congressional District and any District(s) affected by the program or project
5.	Enter legal name of applicant, name of primary organizational unit (including division, if applicable), which will undertake the assistance activity, enter the organization's DUNS number (received from Dun and Bradstreet), enter the complete address of the applicant (including country), and name, telephone number, e-mail and fax of the person to contact on matters related to this application.	15.	Amount requested or to be contributed during the first funding/budget period by each contributor. Value of in kind contributions should be included on appropriate lines as applicable. If the action will result in a dollar change to an existing award, indicate only the amount of the change. For decreases, enclose the amounts in parentheses. If both basic and supplemental amounts are included, show breakdown on an attached sheet. For multiple program funding, use totals and show breakdown using same categories as item 15.
6.	Enter Employer Identification Number (EIN) as assigned by the Internal Revenue Service.	16.	Applicants should contact the State Single Point of Contact (SPOC) for Federal Executive Order 12372 to determine whether the application is subject to the State intergovernmental review process.
7.	Select the appropriate letter in the space provided. <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> A. State B. County C. Municipal D. Township E. Interstate F. Intermunicipal G. Special District H. Independent School District </div> <div style="width: 45%;"> I. State Controlled Institution of Higher Learning J. Private University K. Indian Tribe L. Individual M. Profit Organization N. Other (Specify) O. Not for Profit Organization </div> </div>	17.	This question applies to the applicant organization, not the person who signs as the authorized representative. Categories of debt include delinquent audit disallowances, loans and taxes.
8.	Select the type from the following list: <ul style="list-style-type: none"> "New" means a new assistance award. "Continuation" means an extension for an additional funding/budget period for a project with a projected completion date. "Revision" means any change in the Federal Government's financial obligation or contingent liability from an existing obligation. If a revision enter the appropriate letter: A. Increase Award B. Decrease Award C. Increase Duration D. Decrease Duration 	18.	To be signed by the authorized representative of the applicant. A copy of the governing body's authorization for you to sign this application as official representative must be on file in the applicant's office. (Certain Federal agencies may require that this authorization be submitted as part of the application.)
9.	Name of Federal agency from which assistance is being requested with this application.		
10.	Use the Catalog of Federal Domestic Assistance number and title of the program under which assistance is requested.		

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Attachment 3

Proposal/Application Budget: SF - 424A

OMB Approval No. 0348-0044

BUDGET INFORMATION - Non-Construction Programs

SECTION A - BUDGET SUMMARY						
Grant Program Function or Activity (a)	Catalog of Federal Domestic Assistance Number (b)	Estimated Unobligated Funds		New or Revised Budget		
		Federal (c)	Non-Federal (d)	Federal (e)	Non-Federal (f)	Total (g)
1.		\$	\$	\$	\$	\$
2.						
3.						
4.						
5. Totals		\$	\$	\$	\$	\$
SECTION B - BUDGET CATEGORIES						
6. Object Class Categories	GRANT PROGRAM, FUNCTION OR ACTIVITY					Total (5)
	(1)	(2)	(3)	(4)	(5)	
a. Personnel	\$	\$	\$	\$	\$	\$
b. Fringe Benefits						
c. Travel						
d. Equipment						
e. Supplies						
f. Contractual						
g. Construction						
h. Other						
i. Total Direct Charges (sum of 6a-6h)						
j. Indirect Charges						
k. TOTALS (sum of 6i and 6j)	\$	\$	\$	\$	\$	\$
7. Program Income	\$	\$	\$	\$	\$	\$

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Previous Edition Usable

Standard Form 424A (Rev. 7-97)
Prescribed by OMB Circular A-102

SECTION C - NON-FEDERAL RESOURCES					
(a) Grant Program	(b) Applicant	(c) State	(d) Other Sources	(e) TOTALS	
8.	\$	\$	\$	\$	
9.					
10.					
11.					
12. TOTAL (sum of lines 8-11)	\$	\$	\$	\$	
SECTION D - FORECASTED CASH NEEDS					
	Total for 1st Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
13. Federal	\$	\$	\$	\$	\$
14. Non-Federal					
15. TOTAL (sum of lines 13 and 14)	\$	\$	\$	\$	\$
SECTION E - BUDGET ESTIMATES OF FEDERAL FUNDS NEEDED FOR BALANCE OF THE PROJECT					
(a) Grant Program	FUTURE FUNDING PERIODS (Years)				
	(b) First	(c) Second	(d) Third	(e) Fourth	
16.	\$	\$	\$	\$	
17.					
18.					
19.					
20. TOTAL (sum of lines 16-19)	\$	\$	\$	\$	
SECTION F - OTHER BUDGET INFORMATION					
21. Direct Charges:		22. Indirect Charges:			
23. Remarks:					

INSTRUCTIONS FOR THE SF-424A

Public reporting burden for this collection of information is estimated to average 180 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Budget, Paperwork Reduction Project (0348-0044), Washington, DC 20503.

**PLEASE DO NOT RETURN YOUR COMPLETED FORM TO THE OFFICE OF MANAGEMENT AND BUDGET.
SEND IT TO THE ADDRESS PROVIDED BY THE SPONSORING AGENCY.**

General Instructions

This form is designed so that application can be made for funds from one or more grant programs. In preparing the budget, adhere to any existing Federal grantor agency guidelines which prescribe how and whether budgeted amounts should be separately shown for different functions or activities within the program. For some programs, grantor agencies may require budgets to be separately shown by function or activity. For other programs, grantor agencies may require a breakdown by function or activity. Sections A, B, C, and D should include budget estimates for the whole project except when applying for assistance which requires Federal authorization in annual or other funding period increments. In the latter case, Sections A, B, C, and D should provide the budget for the first budget period (usually a year) and Section E should present the need for Federal assistance in the subsequent budget periods. All applications should contain a breakdown by the object class categories shown in Lines a-k of Section B.

Section A. Budget Summary Lines 1-4 Columns (a) and (b)

For applications pertaining to a *single* Federal grant program (Federal Domestic Assistance Catalog number) and *not requiring* a functional or activity breakdown, enter on Line 1 under Column (a) the Catalog program title and the Catalog number in Column (b).

For applications pertaining to a *single* program *requiring* budget amounts by multiple functions or activities, enter the name of each activity or function on each line in Column (a), and enter the Catalog number in Column (b). For applications pertaining to multiple programs where none of the programs require a breakdown by function or activity, enter the Catalog program title on each line in *Column* (a) and the respective Catalog number on each line in Column (b).

For applications pertaining to *multiple* programs where one or more programs *require* a breakdown by function or activity, prepare a separate sheet for each program requiring the breakdown. Additional sheets should be used when one form does not provide adequate space for all breakdown of data required. However, when more than one sheet is used, the first page should provide the summary totals by programs.

Lines 1-4, Columns (c) through (g)

For *new applications*, leave Column (c) and (d) blank. For each line entry in Columns (a) and (b), enter in Columns (e), (f), and (g) the appropriate amounts of funds needed to support the project for the first funding period (usually a year).

For *continuing grant program applications*, submit these forms before the end of each funding period as required by the grantor agency. Enter in Columns (c) and (d) the estimated amounts of funds which will remain unobligated at the end of the grant funding period only if the Federal grantor agency instructions provide for this. Otherwise, leave these columns blank. Enter in columns (e) and (f) the amounts of funds needed for the upcoming period. The amount(s) in Column (g) should be the sum of amounts in Columns (e) and (f).

For *supplemental grants and changes* to existing grants, do not use Columns (c) and (d). Enter in Column (e) the amount of the increase or decrease of Federal funds and enter in Column (f) the amount of the increase or decrease of non-Federal funds. In Column (g) enter the new total budgeted amount (Federal and non-Federal) which includes the total previous authorized budgeted amounts plus or minus, as appropriate, the amounts shown in Columns (e) and (f). The amount(s) in Column (g) should not equal the sum of amounts in Columns (e) and (f).

Line 5 - Show the totals for all columns used.

Section B Budget Categories

In the column headings (1) through (4), enter the titles of the same programs, functions, and activities shown on Lines 1-4, Column (a), Section A. When additional sheets are prepared for Section A, provide similar column headings on each sheet. For each program, function or activity, fill in the total requirements for funds (both Federal and non-Federal) by object class categories.

Line 6a-i - Show the totals of Lines 6a to 6h in each column.

Line 6j - Show the amount of indirect cost.

Line 6k - Enter the total of amounts on Lines 6i and 6j. For all applications for new grants and continuation grants the total amount in column (5), Line 6k, should be the same as the total amount shown in Section A, Column (g), Line 5. For supplemental grants and changes to grants, the total amount of the increase or decrease as shown in Columns (1)-(4), Line 6k should be the same as the sum of the amounts in Section A, Columns (e) and (f) on Line 5.

Line 7 - Enter the estimated amount of income, if any, expected to be generated from this project. Do not add or subtract this amount from the total project amount, Show under the program

INSTRUCTIONS FOR THE SF-424A (continued)

narrative statement the nature and source of income. The estimated amount of program income may be considered by the Federal grantor agency in determining the total amount of the grant.

Section C. Non-Federal Resources

Lines 8-11 Enter amounts of non-Federal resources that will be used on the grant. If in-kind contributions are included, provide a brief explanation on a separate sheet.

Column (a) - Enter the program titles identical to Column (a), Section A. A breakdown by function or activity is not necessary.

Column (b) - Enter the contribution to be made by the applicant.

Column (c) - Enter the amount of the State's cash and in-kind contribution if the applicant is not a State or State agency. Applicants which are a State or State agencies should leave this column blank.

Column (d) - Enter the amount of cash and in-kind contributions to be made from all other sources.

Column (e) - Enter totals of Columns (b), (c), and (d).

Line 12 - Enter the total for each of Columns (b)-(e). The amount in Column (e) should be equal to the amount on Line 5, Column (f), Section A.

Section D. Forecasted Cash Needs

Line 13 - Enter the amount of cash needed by quarter from the grantor agency during the first year.

Line 14 - Enter the amount of cash from all other sources needed by quarter during the first year.

Line 15 - Enter the totals of amounts on Lines 13 and 14.

Section E. Budget Estimates of Federal Funds Needed for Balance of the Project

Lines 16-19 - Enter in Column (a) the same grant program titles shown in Column (a), Section A. A breakdown by function or activity is not necessary. For new applications and continuation grant applications, enter in the proper columns amounts of Federal funds which will be needed to complete the program or project over the succeeding funding periods (usually in years). This section need not be completed for revisions (amendments, changes, or supplements) to funds for the current year of existing grants.

If more than four lines are needed to list the program titles, submit additional schedules as necessary.

Line 20 - Enter the total for each of the Columns (b)-(e). When additional schedules are prepared for this Section, annotate accordingly and show the overall totals on this line.

Section F. Other Budget Information

Line 21 - Use this space to explain amounts for individual direct object class cost categories that may appear to be out of the ordinary or to explain the details as required by the Federal grantor agency.

Line 22 - Enter the type of indirect rate (provisional, predetermined, final or fixed) that will be in effect during the funding period, the estimated amount of the base to which the rate is applied, and the total indirect expense.

Line 23 - Provide any other explanations or comments deemed necessary.

Attachment 4

Current and Pending Support

**Grand Canyon Monitoring and Research Center, Southwest Biological Science Center, USGS
2255 N. Gemini Dr., Flagstaff, AZ 86001 (928) 556-7217**

Current and Pending Support

Information should be provided for each investigator. Failure to provide this information may delay consideration of this proposal.			
Investigator:			
Support Future	___ Current	___ Pending	___ Submission Planned in Near
Proposal Title:			
Source of Support:			
Award Amount: \$		Person-Months Committed to the Project:	
Support Future	___ Current	___ Pending	___ Submission Planned in Near
Proposal Title:			
Source of Support:			
Award Amount: \$		Person-Months Committed to the Project:	
Support Future	___ Current	___ Pending	___ Submission Planned in Near
Proposal Title:			
Source of Support:			
Award Amount: \$		Person-Months Committed to the Project:	
Support Future	___ Current	___ Pending	___ Submission Planned in Near
Proposal Title:			
Source of Support:			
Award Amount: \$		Person-Months Committed to the Project:	
Support Future	___ Current	___ Pending	___ Submission Planned in Near
Proposal Title:			
Source of Support:			
Award Amount: \$		Person-Months Committed to the Project:	

Use additional sheets as necessary

Attachment 5

Assurances: SF - 424B

OMB Approval No. 0348-0040

ASSURANCES - NON-CONSTRUCTION PROGRAMS

Public reporting burden for this collection of information is estimated to average 15 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Budget, Paperwork Reduction Project (0348-0040), Washington, DC 20503.

PLEASE DO NOT RETURN YOUR COMPLETED FORM TO THE OFFICE OF MANAGEMENT AND BUDGET. SEND IT TO THE ADDRESS PROVIDED BY THE SPONSORING AGENCY.

NOTE: Certain of these assurances may not be applicable to your project or program. If you have questions, please contact the awarding agency. Further, certain Federal awarding agencies may require applicants to certify to additional assurances. If such is the case, you will be notified.

As the duly authorized representative of the applicant, I certify that the applicant:

1. Has the legal authority to apply for Federal assistance and the institutional, managerial and financial capability (including funds sufficient to pay the non-Federal share of project cost) to ensure proper planning, management and completion of the project described in this application.
2. Will give the awarding agency, the Comptroller General of the United States and, if appropriate, the State, through any authorized representative, access to and the right to examine all records, books, papers, or documents related to the award; and will establish a proper accounting system in accordance with generally accepted accounting standards or agency directives.
3. Will establish safeguards to prohibit employees from using their positions for a purpose that constitutes or presents the appearance of personal or organizational conflict of interest, or personal gain.
4. Will initiate and complete the work within the applicable time frame after receipt of approval of the awarding agency.
5. Will comply with the Intergovernmental Personnel Act of 1970 (42 U.S.C. §§4728-4763) relating to prescribed standards for merit systems for programs funded under one of the 19 statutes or regulations specified in Appendix A of OPM's Standards for a Merit System of Personnel Administration (5 C.F.R. 900, Subpart F).
6. Will comply with all Federal statutes relating to nondiscrimination. These include but are not limited to: (a) Title VI of the Civil Rights Act of 1964 (P.L. 88-352) which prohibits discrimination on the basis of race, color or national origin; (b) Title IX of the Education Amendments of 1972, as amended (20 U.S.C. §§1681-1683, and 1685-1686), which prohibits discrimination on the basis of sex; (c) Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. §794), which prohibits discrimination on the basis of handicaps; (d) the Age Discrimination Act of 1975, as amended (42 U.S.C. §§6101-6107), which prohibits discrimination on the basis of age; (e) the Drug Abuse Office and Treatment Act of 1972 (P.L. 92-255), as amended, relating to nondiscrimination on the basis of drug abuse; (f) the Comprehensive Alcohol Abuse and Alcoholism Prevention, Treatment and Rehabilitation Act of 1970 (P.L. 91-616), as amended, relating to nondiscrimination on the basis of alcohol abuse or alcoholism; (g) §§523 and 527 of the Public Health Service Act of 1912 (42 U.S.C. §§290 dd-3 and 290 ee 3), as amended, relating to confidentiality of alcohol and drug abuse patient records; (h) Title VIII of the Civil Rights Act of 1968 (42 U.S.C. §3601 et seq.), as amended, relating to nondiscrimination in the sale, rental or financing of housing; (i) any other nondiscrimination provisions in the specific statute(s) under which application for Federal assistance is being made; and, (j) the requirements of any other nondiscrimination statute(s) which may apply to the application.
7. Will comply, or has already complied, with the requirements of Titles II and III of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (P.L. 91-646) which provide for fair and equitable treatment of persons displaced or whose property is acquired as a result of Federal or federally-assisted programs. These requirements apply to all interests in real property acquired for project purposes regardless of Federal participation in purchases.
8. Will comply, as applicable, with provisions of the Hatch Act (5 U.S.C. §§1501-1508 and 7324-7328) which limit the political activities of employees whose principal employment activities are funded in whole or in part with Federal funds.

9. Will comply, as applicable, with the provisions of the Davis-Bacon Act (40 U.S.C. §§276a to 276a-7), the Copeland Act (40 U.S.C. §276c and 18 U.S.C. §874), and the Contract Work Hours and Safety Standards Act (40 U.S.C. §§327-333), regarding labor standards for federally-assisted construction subagreements.
10. Will comply, if applicable, with flood insurance purchase requirements of Section 102(a) of the Flood Disaster Protection Act of 1973 (P.L. 93-234) which requires recipients in a special flood hazard area to participate in the program and to purchase flood insurance if the total cost of insurable construction and acquisition is \$10,000 or more.
11. Will comply with environmental standards which may be prescribed pursuant to the following: (a) institution of environmental quality control measures under the National Environmental Policy Act of 1969 (P.L. 91-190) and Executive Order (EO) 11514; (b) notification of violating facilities pursuant to EO 11738; (c) protection of wetlands pursuant to EO 11990; (d) evaluation of flood hazards in floodplains in accordance with EO 11988; (e) assurance of project consistency with the approved State management program developed under the Coastal Zone Management Act of 1972 (16 U.S.C. §§1451 et seq.); (f) conformity of Federal actions to State (Clean Air) Implementation Plans under Section 176(c) of the Clean Air Act of 1955, as amended (42 U.S.C. §§7401 et seq.); (g) protection of underground sources of drinking water under the Safe Drinking Water Act of 1974, as amended (P.L. 93-523); and, (h) protection of endangered species under the Endangered Species Act of 1973, as amended (P.L. 93-205).
12. Will comply with the Wild and Scenic Rivers Act of 1968 (16 U.S.C. §§1271 et seq.) related to protecting components or potential components of the national wild and scenic rivers system.
13. Will assist the awarding agency in assuring compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (16 U.S.C. §470), EO 11593 (identification and protection of historic properties), and the Archaeological and Historic Preservation Act of 1974 (16 U.S.C. §§469a-1 et seq.).
14. Will comply with P.L. 93-348 regarding the protection of human subjects involved in research, development, and related activities supported by this award of assistance.
15. Will comply with the Laboratory Animal Welfare Act of 1966 (P.L. 89-544, as amended, 7 U.S.C. §§2131 et seq.) pertaining to the care, handling, and treatment of warm blooded animals held for research, teaching, or other activities supported by this award of assistance.
16. Will comply with the Lead-Based Paint Poisoning Prevention Act (42 U.S.C. §§4801 et seq.) which prohibits the use of lead-based paint in construction or rehabilitation of residence structures.
17. Will cause to be performed the required financial and compliance audits in accordance with the Single Audit Act Amendments of 1996 and OMB Circular No. A-133, "Audits of States, Local Governments, and Non-Profit Organizations."
18. Will comply with all applicable requirements of all other Federal laws, executive orders, regulations, and policies governing this program.

SIGNATURE OF AUTHORIZED CERTIFYING OFFICIAL	TITLE	
APPLICANT ORGANIZATION		DATE SUBMITTED

Standard Form 424B (Rev. 7-97) Back

Attachment 6

Certifications: DI 2010

U.S. Department of the Interior

Certifications Regarding Debarment, Suspension and Other Responsibility Matters, Drug-Free Workplace Requirements and Lobbying

Persons signing this form should refer to the regulations referenced below for complete instructions:

Certification Regarding Debarment, Suspension, and Other Responsibility Matters - Primary Covered Transactions - **The prospective primary participant further agrees by submitting this proposal that it will include the clause titled, "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion - Lower Tier Covered Transaction," provided by the department or agency entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions. See below for language to be used or use this form certification and sign. (See Appendix A of Subpart D of 43 CFR Part 12.)**

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion - Lower Tier Covered Transactions - (See Appendix B of Subpart D of 43 CFR Part 12.)

Certification Regarding Drug-Free Workplace Requirements - Alternate I. (Grantees Other Than Individuals) and Alternate II. (Grantees Who are Individuals) - (See Appendix C of Subpart D of 43 CFR Part 12)

Signature on this form provides for compliance with certification requirements under 43 CFR Parts 12 and 18. The certifications shall be treated as a material representation of fact upon which reliance will be placed when the Department of the Interior determines to award the covered transaction, grant, cooperative agreement or loan.

PART A: Certification Regarding Debarment, Suspension, and Other Responsibility Matters- Primary Covered Transactions

CHECK _____ IF THIS CERTIFICATION IS FOR A PRIMARY COVERED TRANSACTION AND IS APPLICABLE.

- (1) The prospective primary participant certifies to the best of its knowledge and belief, that it and its principals:
 - (a) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded by any Federal department or agency;
 - (b) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;
 - (c) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (1)(b) of this certification; and
 - (d) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.
- (2) Where the prospective primary participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

PART B: Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion - Lower Tier Covered Transactions

CHECK _____ IF THIS CERTIFICATION IS FOR A LOWER TIER COVERED TRANSACTION AND IS APPLICABLE.

- (1) The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.
- (2) Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

This form was electronically produced by Elite Federal Forms, Inc.

DI-2010
June 1995
(This form replaces DI-1953, DI-1954,
DI-1955, DI-1996 and DI-1963)

PART C: Certification Regarding Drug-Free Workplace Requirements

CHECK___IF THIS CERTIFICATION IS FOR AN APPLICANT WHO IS NOT AN INDIVIDUAL.

Alternate I. (Grantees Other Than Individuals)

A. The grantee certifies that it will or continue to provide a drug-free workplace by:

- (a) Publishing a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the grantee's workplace and specifying the actions that will be taken against employees for violation of such prohibition;
- (b) Establishing an ongoing drug-free awareness program to inform employees about--
 - (1) The dangers of drug abuse in the workplace;
 - (2) The grantee's policy of maintaining a drug-free workplace;
 - (3) Any available drug counseling, rehabilitation, and employee assistance programs; and
 - (4) The penalties that may be imposed upon employees for drug abuse violations occurring in the workplace;
- (c) Making it a requirement that each employee to be engaged in the performance of the grant be given a copy of the statement required by paragraph (a);
- (d) Notifying the employee in the statement required by paragraph (a) that, as a condition of employment under the grant, the employee will --
 - (1) Abide by the terms of the statement; and
 - (2) Notify the employer in writing of his or her conviction for a violation of a criminal drug statute occurring in the workplace no later than five calendar days after such conviction;
- (e) Notifying the agency in writing, within ten calendar days after receiving notice under subparagraph (d)(2) from an employee or otherwise receiving actual notice of such conviction. Employers of convicted employees must provide notice, including position title, to every grant officer on whose grant activity the convicted employee was working, unless the Federal agency has designated a central point for the receipt of such notices. Notice shall include the identification number(s) of each affected grant;
- (f) Taking one of the following actions, within 30 calendar days of receiving notice under subparagraph (d)(2), with respect to any employee who is so convicted --
 - (1) Taking appropriate personnel action against such an employee, up to and including termination, consistent with the requirements of the Rehabilitation Act of 1973, as amended; or
 - (2) Requiring such employee to participate satisfactorily in a drug abuse assistance or rehabilitation program approved for such purposes by a Federal, State, or local health, law enforcement, or other appropriate agency;
- (g) Making a good faith effort to continue to maintain a drug-free workplace through implementation of paragraphs (a) (b), (c), (d), (e) and (f).

B. The grantee may insert in the space provided below the site(s) for the performance of work done in connection with the specific grant:

Place of Performance (Street address, city, county, state, zip code)

Check___if there are workplaces on files that are not identified here.

PART D: Certification Regarding Drug-Free Workplace Requirements

CHECK___IF THIS CERTIFICATION IS FOR AN APPLICANT WHO IS AN INDIVIDUAL.

Alternate II. (Grantees Who Are Individuals)

- (a) The grantee certifies that, as a condition of the grant, he or she will not engage in the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance in conducting any activity with the grant;
- (b) If convicted of a criminal drug offense resulting from a violation occurring during the conduct of any grant activity, he or she will report the conviction, in writing, within 10 calendar days of the conviction, to the grant officer or other designee, unless the Federal agency designates a central point for the receipt of such notices. When notice is made to such a central point, it shall include the identification number(s) of each affected grant.

DI-2010
June 1995
(This form replaces DI-1953, DI-1954,
DI-1955, DI-1956 and DI-1963)

PART E: Certification Regarding Lobbying
Certification for Contracts, Grants, Loans, and Cooperative Agreements

*CHECK ____ IF CERTIFICATION IS FOR THE AWARD OF ANY OF THE FOLLOWING AND
THE AMOUNT EXCEEDS \$100,000: A FEDERAL GRANT OR COOPERATIVE AGREEMENT;
SUBCONTRACT, OR SUBGRANT UNDER THE GRANT OR COOPERATIVE AGREEMENT.*

*CHECK ____ IF CERTIFICATION FOR THE AWARD OF A FEDERAL
LOAN EXCEEDING THE AMOUNT OF \$150,000, OR A SUBGRANT OR
SUBCONTRACT EXCEEDING \$100,000, UNDER THE LOAN.*

The undersigned certifies, to the best of his or her knowledge and belief, that:

- (1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, and officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
- (2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.
- (3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by Section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

As the authorized certifying official, I hereby certify that the above specified certifications are true.

SIGNATURE OF AUTHORIZED CERTIFYING OFFICIAL

TYPED NAME AND TITLE

DATE

DI-2010
June 1995
(This form replaces DI-1953, DI-1954,
DI-1955, DI-1956 and DI-1963)

Attachment 7

GRAND CANYON MONITORING AND RESEARCH CENTER PROTOCOLS FOR NATIONAL PARK SERVICE PERMIT APPLICATION REVIEW AND APPROVAL

GENERAL INSTRUCTIONS FOR GCMRC FUNDED RESEARCH PROJECTS

All research and monitoring projects conducted in Grand Canyon National Park or Glen Canyon National Recreation Area must have their own NPS Research and Collecting Permit. GCMRC funded researchers must submit NPS Research and Collecting Permit applications and proposals to the GCMRC for internal and external review prior to submittal to the GCNP Research Permits Office. Upon approval by the GCMRC, permit applications and proposals are submitted online to the GCNP Research Permits office by the GCMRC Research Coordinator. Research & Collecting Permits are issued by the NPS through a review process that requires approximately 90 days. The permitting process is a critical component that enables Grand Canyon NP to understand ongoing research projects and incorporate this knowledge into their research database resulting in more informed management of valuable resources.

Following submittal of a research and collecting permit, direct communication between the NPS Research and the Principal Investigator may occur to clarify questions. All direct communication between the PI and the NPS Research Coordinator must be documented/cc'd to the GCMRC Research Coordinator (cfritz@usgs.gov). Final copies of all approved permits are kept on file in the office of the GCMRC Research Coordinator with copies placed in project files.

Information regarding NPS procedures and requirements for an R & C permit can be reviewed on-line via the NPS Research Permits website: <http://science.nature.nps.gov/research> via the NP PERMITS/IARS link, (<http://science.nature.nps.gov/permits/servlet/PubIndexServlet>). View the links on Applications, Requirements, Proposals, etc. before selecting the GRAND CANYON NP or GLEN CANYON NRA links. On the GCNP/GLNRA sites view the info on PARK SPECIFIC CONDITIONS & GENERAL CONDITIONS regarding information pertaining to regulations and requirements for research activities.

The following information is intended to clarify the permitting procedures required by the GCMRC in compliance with the National Park Service (NPS) for all research activities conducted within the boundaries of Glen Canyon National Recreation Area and Grand Canyon National Park. The two types of permits that must be obtained prior to conducting any research activities are,

- 1) Research and Collecting Permit (a 90 day process).
- 2) River Access Permit (an additional 60 day process).

It is very important to remember that the entire process from the initiation of the R & C Permit Application, plus the 60 day period to process the Access Permit will take at least 5 months to complete. Researchers intending to conduct research activities in the Grand Canyon National Park must allow for this 5 month period to complete the permitting process BEFORE they can expect to conduct their research activities!

Procedures for obtaining each of these permits are described below:

Step I: Research and Collecting Permit

GUIDELINES TO RESEARCHERS FOR STUDY PROPOSALS

Proposals should include each of the required information items listed below, in enough detail that an educated non-specialist can understand exactly what you plan to do. If you have already prepared a relevant proposal for a funding application, work plan, formal agreement, or similar document, then your original proposal likely will satisfy National Park Service (NPS) proposal requirements. The

primary area where new information may be necessary concerns the ability of the park to assess what, if any, impacts your research may have on park resources. You should compare your original proposal to these guidelines to be certain that you have provided all the required information. If additional information is required, you can provide it in a cover letter or supplement to your proposal, as appropriate. If a required topic does not apply to your proposed study, simply list the topic and write “not applicable.”

The length of your proposal depends primarily on the complexity of the work planned. In some cases, a proposal may consist of a couple of pages for a study expected to have no significant impact on park resources or visitor experiences. However, proposals for lengthy or complex research problems, for extensive collecting, and for work with special status species or sensitive cultural resources are typically longer, more detailed, and well-organized. Incomplete, disorganized, or illegible proposals will be returned for revision.

RESEARCH PROPOSAL REQUIREMENTS:

- I. **INTRODUCTION**
 - A. **Title**
 - B. **Date of proposal**
 - C. **Investigators** - name, title, address, telephone number, FAX number, email address, and institutional affiliation of the principal investigator and the name and affiliation of all additional investigators listed in the proposal.
 - D. **Table of contents** - Recommended for long or complicated proposals.
 - E. **Abstract** – (and keywords)
- II. **BACKGROUND** - Summarize the proposed project by describing in general the problem or issue being investigated as well as any previous pertinent research.
 - A. **Statement of issue** – Importance, relevance, background information.
 - B. **Literature summary** – on research investigation.
 - C. **Scope of study** - geographic and scientific scope of the project.
 - D. **Intended use of results** - Describe how the products will be used, including any anticipated commercial use.
- III. **OBJECTIVES/HYPOTHESES TO BE TESTED** - Describe the specific objectives of the proposed project. Where appropriate, the objectives should be stated as specific hypotheses to be tested.
- IV. **METHODS** – Describe how the proposed methods and analytical techniques will achieve the study objectives or test the stated hypothesis/question. Provide pertinent literature citations.
 - A. **Description of study area** – Clearly describe the study area in terms of park name(s), geographic location(s), and place names. You should provide maps, park names, or geographic coordinates as appropriate. Indicate whether your work will take place in an area designated or managed as “wilderness” by the National Park Service.
 - B. **Procedures** – Construct a TABLE that lists out SITES, DATES OF VISIT, ACTIVITIES, TOOLS, PERSONNEL. Also, in the proposal text, describe study design that addresses the stated objectives and explain exact methods and protocols to be employed in the field and laboratory.
 - C. **Collections** - Describe the type, size, and quantity of specimens or materials to be collected, sampled, or captured, and your plans to remove them from the collecting site. Describe existing collections of similar specimens and why additional collecting is necessary. Provide scientific nomenclature where possible. Provide information on all other applicable federal or state permits where required.
 - D. **Analysis** - Explain data analysis and how that will assist in meeting the stated objectives or test the hypotheses. Include any statistical techniques or mathematical models necessary to the understanding of the analysis.

- E. **Schedule** - Provide an exact schedule that includes start of project, approximate dates or seasons of fieldwork, analysis, reporting, and completion dates.
 - F. **Budget** - Outline the costs of personnel, equipment, etc associated with this project and identify your expected funding source(s). Include the anticipated costs pertaining to the cataloging of collected and permanently retained specimens or materials.
- V. **PRODUCTS**
- A. **Publications and reports** - Describe the expected publications.
 - B. **Collections** – Describe disposition of collected specimens or materials.
 - C. **Data and other materials** - Describe any other products to be generated as part of the project, such as, photographs, maps, models, handouts, exhibits, software presentations, raw data, GIS coverage, or videos, and the proposed disposition of these materials. If data is to be collected from the public as part of this study, provide a copy of the data collection instrument (survey, questionnaire, interview protocol, etc.).
- VI. **LITERATURE CITED** - Include full bibliographic citations for all reports and publications referenced in the proposal.
- VII. **QUALIFICATIONS** - Provide a curriculum vitae for the principal investigator and other investigators listed in the proposal. Identify their training and qualifications relevant to the proposed project and their ability to conduct field activities in the environment of the proposed study area. Describe previous research and collecting in NPS areas, including study and permit numbers if available.
- VIII. **SUPPORTING DOCUMENTATION AND SPECIAL CONCERNS**
- Outside Peer Reviews
 - Other required permits (state, federal, tribal).
 - Wilderness and Park management concerns:
 - A. **Safety**
 - B. **Access to study sites**
 - C. **Use of mechanized equipment**
 - D. **Chemical use**
 - E. **Ground disturbance** - Describe the type, location, area, depth, number, and distribution of expected ground-disturbing activities, such as soil pits, cores, stakes, or latrines. Describe plans for site restoration of significantly affected areas.
 * Proposals that entail ground disturbance may require an archeological survey and special clearance prior to approval of the study. You can help reduce the extra time that may be required to process such a proposal by including identification of each ground disturbance area on a USGS 7.5-minute topographic map.
 - F. **Animal welfare**
 - G. **NPS assistance** - Describe any NPS assistance needed to complete the proposed study, such as use of equipment or facilities or assistance from staff.
 - H. **Wilderness “minimum requirement” protocols** - your proposal should describe how the project adheres to wilderness “minimum requirement” and “minimum tool” concepts.
- IX. **SHORT-NOTICE FLOOD CONTINGENCY PLANS-Contingency Plans need to be included in your proposal so the Park can also review your study / collection plans in the event of artificial floods/flows.** Extra trips or activities will not be approved unless they were approved in the original proposal.
- X. **MINIMUM REQUIREMENT ANALYSIS (MRA)-MOST OF GRAND CANYON NATIONAL PARK IS MANAGED AS WILDERNESS (INCLUDING THE RIVER CORRIDOR).** Management restrictions apply and affect approval of transportation means, field work timing and frequency, group size, and the use of mechanized or motorized tools. We ask that you limit your activities to the minimum necessary to meet the objectives of your approved proposal. With few exceptions, research use of aircraft, motor vehicles, motor boats, generators, or motor-powered devices of any kind are not allowed within areas managed as wilderness. However, if motor use or any potential activity outside

or wilderness requirements is essential to your research, you are required to submit a detailed written justification including consideration of alternative methods or equipment in the SUPPORTING DOCUMENTATION AND SPECIAL CONCERNS section of your study proposal in order for your activity to be considered for approval.

MRA Guidelines and Analysis:

GRAND CANYON NATIONAL PARK WILDERNESS MANAGEMENT

90% of Grand Canyon National Park is Proposed wilderness. Although the importance of wilderness areas for scientific study has long been recognized, many issues connected with wilderness and technology remain unresolved. Since 1996 the park has reviewed new research proposals under an evolving wilderness minimum requirement process.

The Wilderness Act of 1964 states that "except as necessary to meet the minimum requirements for the administration of the area...there shall be no temporary road, no use of motor vehicles, motorized equipment or motorboats, no landing of aircraft, no other form of mechanical transport, and no structure or installation" within a Wilderness area.

The minimum requirement concept enables managers to examine and document if a proposed management action is appropriate in wilderness, and if it is, what is the least intrusive equipment, regulation, or practice (minimum tool) that will achieve wilderness management objectives. The completion of this process assists managers in making informed and appropriate decisions concerning actions conducted in wilderness.

To apply the minimum requirement concept at Grand Canyon National Park, a Minimum Requirement Analysis will be completed for any management action, including but not limited to, natural and cultural resource projects, administrative facilities, maintenance activities, trail and camp area projects, and research, within wilderness.

Those initiating new actions in wilderness must complete the two-step documented process which includes:

- 1) A determination as to whether or not a proposed management action is appropriate or necessary for the administration of the areas as wilderness, and does not pose a significant impact to the wilderness resources and character, and**
- 2) If the project has been determined to be appropriate and necessary in wilderness, the selection of the management method (tool) that causes the least amount of impact to the physical resources and experiential qualities (character) of wilderness. Use of any prohibited activity must be clearly documented as the appropriate minimum method.**

Minimum Method (Tool) is defined as: a use or activity, determined to be appropriate or necessary for the administration of the area as wilderness, which makes use of the least intrusive tool, equipment, device, force, regulation or practice that will achieve the wilderness management objective.

The determination as to whether or not an action has an adverse impact on wilderness must consider both the physical resources within wilderness and wilderness characteristics and values. Prior to implementation of a project, the Minimum Requirement Analysis worksheet will be reviewed by the project leads division chief, and the Wilderness Steering Committee chair or his/her designee. Final approval will be made by the Superintendent or designee.

- 1. DESCRIBE IN DETAIL, ALTERNATIVE WAYS TO ACCOMPLISH THE PROPOSED ACTION.** (The may include primitive skills/tool, mechanized/motorized, and/or combination of alternatives.)

GUIDING QUESTIONS TO ANSWER FOR EACH ALTERNATIVE:

- *What is proposed?*
- *Where will the action take place? (location)*
- *When will the action take place? (dates/use periods)*
- *How often will this activity take place? (frequency)*
- *How long will it take to complete the activity? (duration)*
- *What design and standards will apply?*
- *What methods and techniques will be used? (tools, etc.)*
- *How many people are needed to complete the action?*
- *Why is it being proposed in this manner?*
- *If there are adverse impacts, how long will they persist?*
- *What mitigation will take place to minimize impacts?*

CRITERIA TO EVALUATE ALTERNATIVES:

- *Biophysical effects (magnitude, duration, and frequency)*
- *Social/Recreational/Experiential effects*
- *Societal/Political effects*
- *Health/Safety concerns*
- *Economical and Timing considerations*

ALTERNATIVE 1:

ALTERNATIVE 2:

ALTERNATIVE 3:

ALTERNATIVE 4:

RESPONSIBILITIES OF RESEARCHERS:

The Research and Collecting permit authorizes only those specific activities that were approved following proposal review and are listed in your permit. Please read the finalized permit carefully! Activities not listed or authorized in your permit are not allowed. Field assistants working without direct supervision should have in their possession: Permit copy, letter from the P.I. and GRCA Research Office acknowledging their activities, and a full understanding of what the Permit allows. Rangers may ask to see your permit and are authorized to enforce all restrictions.

All Investigators and field trip assistants are responsible for compliance with the requirements and regulations of their Research & Collecting Permit. Failure on the part of the Investigators or assistants to adhere to park and permit policies may result in termination of their Permit and other penalties.

DELIVERABLES:

A condition of your agreement with the NPS for your R & C Permit requires submitting a completed Investigators Annual Report (IAR) each year and Investigators Final Report (IFR) at the end of your study just as you would submit to your funding agency. **Failure to submit an IAR may result in revocation of your R & C permit or non-approval of future river access permits. Failure to submit an IFR may disqualify the Principal Investigator for future R & C permits.**

MODIFICATIONS

R & C Permits may be issued for multiple years. Under limited circumstances R & C permits may be modified after issue to reflect **minor** changes in project methods, logistics, or personnel. In the event that minor modifications to the permit are required in order to support the project's progress, the investigator may submit a request for modification to the NPS Permit Office. Proposed modifications must be in accordance with the scope of work authorized by the original permit. Examples of such changes may include; use of updated technological equipment, number of trips requested, change of personnel, etc. Proposed modifications must be submitted for review by the NPS a minimum of 90 days prior to implementation. Any major changes to an existing permit will require resubmission of an application and research proposal and issue of a new R & C permit. **It is at the sole discretion of the NPS to determine approval of proposed modifications or to require a new R & C permit.**

Step II: Access Permits

NPS Access permits are required for:

- All river launches (except day-trips upstream of Lees Ferry)
- Aircraft use over park lands
- Backcountry camping - above or below rim.
- Cave trips
- Educational trips, filming, etc.

Principal Investigators in possession of a valid R & C Permit for a GCMRC funded project may apply for river access permits as specified in their R & C permit by submitting a **River Trip Request Form to the GCMRC Logistics Coordinator a minimum of 60 days prior to the requested trip launch date. The purpose of this form is to:**

- Provide information required for submitting a Trip Permit Application to the NPS Research Permits office a minimum of 45 days prior to the trip launch date, and
- Provide information required for making all logistical and technical support arrangements for the trip.

Copies of all approved R & C permits are forwarded to and kept on file by the GCMRC Logistics Coordinator. A copy of the valid R & C Permit and a signed/dated copy of the Research Use Affidavit/Notice of Adverse Actions of Penalties Form is attached to each River Access Permit Application and submitted by the GCMRC Logistics Coordinator to the NPS Research Permits office a minimum of 45 days in advance of the requested launch date.

Combining projects on individual trips: Various research projects may combine on field/river trips; however all Projects, P.I.s, Permittees and their respective Permits must be listed/attached on the River Access Application. Failure to report additional research projects and personnel may result in withdrawal of the Access Permit and/or the Research Permit of the P.I. submitting the original Access Application.

Various research projects may combine on field trips; however each project, permit, and associated permittees must be listed on the Access (or launch) Permit Application. Failure to report additional research projects and personnel may result in termination of the Access Permit and/or the Research & Collecting Permit of the P.I.(s) on the Permit. Additionally, photocopies of all associated Research & Collecting Permits must be carried during combined field trips.

Trip Permits: Upon approval, trip permits are issued to the GCMRC Logistics Coordinator in the name of the PI's designated Permittee. A photocopy of the trip permit and photocopies of all associated Research & Collecting Permits must be carried by the Permittee during field trips.

Compliance: All Investigators, Permittees, and field trip assistants are responsible for compliance with the regulations and restrictions of their Research & Collecting Permit. A National Park Service representative may accompany the permittee in the field to ensure compliance with regulations. All PI's and their designated Permittee's are required to sign a Research Use Affidavit/Notice of Adverse Actions of Penalties Form which outlines potential penalties for violations of permit conditions. **Failure on the part of the Investigators or assistants to adhere to Park and Permit regulations may result in withdrawal of their permit and other penalties.**

Final Personnel Roster/Bilateral Agreement: Prior to the launch of a permitted trip, the Trip Permittee must submit to the Logistics Coordinator a final list of trip participants and sign the GCMRC Bilateral Agreement. This information is kept in the trip file and submitted to the NPS Lee's Ferry Ranger for trip check-in purposes. All participants are required to show picture ID to the Lee's Ferry Ranger prior to the trip launch.

Attachment 8
Grand Canyon Monitoring and Research Center
Data Request Form
 Information Technologies Department

Requestor Information Form

Date: _____

Requested by: _____ Phone: (Area code) _____

Organization: _____ Department or Program: _____

Address: _____

Email: _____

Request Delivery Date: _____

Request Justification: *(Check all that apply)*

Contract Requirement _____ Internal GCMRC Request _____ TWG / AMWG Request _____ Public Request _____

Other *(Please explain)* _____

A. Data Request Form

***Please Note: Most data is accessible via our website**
(Data will be delivered on CD-ROM or DVD-ROM. GCMRC will deliver 5 CD-ROMs or 1 DVD-ROM maximum per year. CD/DVD writers are available in the GCMRC Library for authorized personnel to create their own CD/DVDs for large data requests. Please allow 4 –6 weeks to fill requests.)

Name of Data Set(s): _____

Brief Description of Data Set(s): _____

Creator *(If Known)*: _____ Creation Date *(If Known)*: _____

Deliverable Format: GIS data format (ArcINFO export file - e00) _____ Database table (ASCII format) _____

Additional Information: _____

Attachment 9

DATA STANDARDS, DELIVERY REQUIREMENTS, AND REPORT PREPARATION

Last Update: May 5, 2005

A) General Guidelines

- 1) Duplicate copies of all reports and documents shall be delivered to GCMRC in both electronic format and paper copy. The contract number, cooperative agreement number, and trip ID, if applicable, must be placed upon the first page of the report. Data deliverables shall contain a contract number and description of deliverable on a cover sheet included with the data. The description of the data shall include the status and type of the data/report (i.e., draft, final, trip report) and a description of the contract/agreement deliverable being satisfied by the report/data. All correspondence must include contract number or cooperative agreement number and task identification number.
- 2) All reports and data shall be delivered to the records officer at the following address:
ATTN: Serena Mankiller, Record Officer – MS9394
Grand Canyon Monitoring and Research Center
2255 N. Gemini Drive
Flagstaff, AZ 86001
- 3) Raw and processed data and reports shall be delivered in electronic format on CDROM or DVD.
- 4) Geographic Information System (GIS) data shall conform with National Mapping and National Spatial Data Infrastructure (NSDI - <http://www.fgdc.gov/nsdi/nsdi.html>) standards where standards have been established.
- 5) Physical and biological data shall conform to National Biological Information Infrastructure (NBII) standards where standards have been established. Content standards can be found at: <http://www.nbii.gov/standards/index.html>
- 6) Each data set shall be accompanied by metadata conforming to the Federal Geographic Data Committee (FGDC) metadata standards where established. Content standards can be found at: <http://www.fgdc.gov/metadata/contstan.html>
- 7) All database measurements shall be supplied in Standard International units.
- 8) All data shall be year 2000 compliant.
- 9) All raw and processed data, field notes, metadata, samples, and sample collection forms generated or collected through scientific activities are the property of the U. S. Government and will be made available to the public as specified in the Release of Data section (G-4) of this document. All materials shall be delivered to the GCMRC and the National Park Service (NPS) in accordance with research and collecting permits, upon completion of the agreement.
- 10) All data received will require a 45 day evaluation period for the GCMRC to verify its completeness related to the contract specifications and GCMRC data standards.

B) Discovery of data collection protocols, quality control procedures, and quality assurance results

Each data collection activity requires a documented protocol that includes appropriate quality control procedures and quality assurance checks. Data collection protocols, quality control procedures, and quality assurance results must accompany data sets upon delivery as part of the metadata requirement.

C) Confidential/restricted data

Availability and archiving of confidential, restricted, and/or sensitive data will be addressed with individual agreements.

D) Ownership of data

All raw and processed data, field notes, samples, and sample collection forms generated or collected under this agreement are the property of the U. S. Government and are to be delivered to the GCMRC, or the National Park Service (NPS) in accordance with research and collecting permits, upon completion of the agreement.

E) Timeliness of data delivery

Data designated as research data shall be delivered to GCMRC at the completion of the agreement. Data designated as monitoring data shall be delivered to GCMRC within the time frames specified in the agreement. Data delivery of monitoring data shall include raw and processed data, original field notes, samples, and sample collection forms at the discretion of the GCMRC.

F) Data delivery requirements

- 1) GIS data shall be delivered electronically using ARC/INFO export format (e00) for coverages and grids with accompanying FGDC compliant metadata. For more information on metadata see the metadata section (Section F, Item 11).

Coverages and Grids must be delivered with the following map coordinate system:

Projection	STATEPLANE
Fipszone	202 (Arizona Central)
Datum	NAD83
Units	METERS
Spheroid	GRS1980

The vertical datum is NAVD 88.

When vertical position (elevation or z) is required to be reported with a dataset, all RAW data deliverables shall contain a data item with the ellipsoid height as well one with GEOID elevations. All data shall be delivered with elevations derived using the most current GEOID (e.g. GEOID99). Derived products with elevation values only need to report the GEOID elevation value. It is the responsibility of the contractor to clarify which deliverables require ellipsoid heights and which do not.

Maps shall be delivered in Arc/Info map composition format (Arcplot) with associated, thoroughly documented Arc Macro Language (AML) included, OR as ESRI ArcMap document with relative paths to set to data sets included with the delivery.

- 2) All data shall be delivered in double precision, i.e. 15 significant digits. Where multiple coverages of point data are to be delivered for an area, the geographic coordinates of any particular data point in all the deliverables shall have the same geographic coordinate values to 15 significant digits.
- 3) Tabular data shall be delivered electronically using comma delimited ASCII files. Null values will be represented by two commas with no space or information between them, e.g. “,”. Data shall be delivered with accompanying FGDC compliant metadata where defined and applicable. File header information must contain the number of records, and field descriptors identifying column names, data types (i.e. date, integer, floating, etc.), field widths, decimal places and units.
- 4) Written reports and documents shall be delivered in hard copy form and electronically in Microsoft Word 98 or more recent format, or Portable Document Format (PDF). All text, charts, pictures, graphics, and tables must be integrated into a single file. All electronic reports shall be compliant with Section 508 of the Rehabilitation Act (accessible to people with vision disabilities).
- 5) Trip reports, where applicable, shall be delivered in hard copy form and electronically in Microsoft Word 98 or more recent format, or PDF format, within two weeks of trip completion. Trip reports shall describe successful as well as unsuccessful data collection efforts, and must contain, but are not be limited to, the following information:
 - a) Project title.
 - b) GCMRC Contract/Agreement Number, and submittal number if applicable.
 - c) Authors: name and affiliations of investigators.
 - d) Submittal date.
 - e) GCMRC Trip_ID(s), if applicable.
 - f) Date(s) of fieldwork.
 - g) Description of field methods.
 - h) Description of data files accompanying submittal.
 - i) Description of each column within each accompanying data file, including column name, position, units and data type.
 - j) Number of records in each data file.
 - k) Geographic coordinates and datum (and/or river mile system) used in locating sample information.
 - l) Any other information about the data set that will lend to clarity of understanding.
- 6) All data requires a spatial locator in Stateplane coordinate system. Accuracy requirements for the spatial positioning will be specified by GCMRC on a project by project basis.
- 7) All compression of files will occur using the GZIP utility. If the GZIP utility is used, it must be copied to each CDROM with GZIPPED compressed files on it.

- 8) Data will be delivered using one of these file naming conventions (the GCMRC will direct which file naming convention is appropriate to follow on a case-by-case basis):

File naming convention for data delivered by flightlines

- a) Flightline/exposure or Flightline/type of data
- b) Flightlines shall start at 1 and continue downstream in numeric order.
- c) Flightlines and Exposure numbers shall be four digits in all file names.

Examples:

- a) fl0001exp0001.tif
- b) fl1432exp2001.tif
- c) fl0023_pts

All other data shall be delivered by USGS quarter-quads

A nation-wide USGS ftp server contains an Arc/Info export file of the quarter-quads coverage at the following location:

ftp://ftpext/pub/wr/az/flagstaff/GCMRC_GIS_DATA/quarterquad.e00.

Use this FILENAME attribute to develop the export filenames. The "FILENAME" attribute contains the USGS quad-code, i.e. 35113G3 with a prefix of "SE, SW, NE, NW" for the appropriate quarter-quad. An additional 4 characters are available to specify the type of data. For example, a contour file within the Northwest Diamond Peak quarter-quad would be named, "NW35113G3_con.e00"

- 9) CDROM/DVD media delivery specifications:

- a) No paper adhesive labels be fixed on the face of the media. If contractor does not have a media writer that prints directly onto the face of the media, the label information will be merely inserted in the jewel case.
- b) Imprinting on media face must be done to allow distinct identification of the CD (in case it is separated from its jewel case. This may mean that minimal or no contractor logo information is printed on the face.
- c) The back cover of the jewel case will contain the contents of the media and the side of that back cover will uniquely identify the media by the contract number, trip id, date, flight line, picture sequence, and possibly data type.
- d) Duplicate copies of all media are required at the time of delivery.

- 10) Imagery NODATA Values

- a) 8-bit data – Store NODATA as 0.
- b) 12-bit or higher data – Store NODATA as largest negative value possible.

- 11) Metadata Requirements

- a) Each file delivered to the GCMRC must have FGDC compliant metadata including, but not limited to, ESRI export format files (.e00), imagery (tif), compressed imagery (.sid), and tabular data (.txt).
- b) All metadata shall be developed with the metadata tool (ArcCatalog) in Desktop Arc/Info. Metadata files shall be delivered with coverages in the same e00 file. In addition to the copy within the e00 file, a XML format copy

of the metadata with the same root file name as the file it pertains to must accompany each deliverable. Metadata must be delivered on the same CDROM as the file it pertains to.

- c) Raw Imagery metadata shall contain the exterior orientation and pointing parameters that includes, but is not necessary limited to:

camera type

Calibrated focal length

Camera position and orientation from airborne GPS and IMU

X Y Z (MSL) Omega Phi Kappa

Time and day of the exposure:

Approximate photograph corner coordinates as

projected from the airborne GPS photo center

coordinate data collected simultaneously with the
photography:

Exterior orientation and camera pointing parameter information shall be stored in the XML format metadata file under the Entity and Attribute Overview section (see example in Appendix B).

- d) Metadata shall contain all the components, but is not limited to, those items contained in the metadata examples in Appendix A (Vector Metadata Examples) and Appendix B (Raster Metadata Example). Metadata shall be formatted according to the examples provided in the Appendix. Additional information, beyond those items demonstrated in the metadata examples, may be necessary to be included in the metadata to ensure its completeness. Additional required metadata components for a particular deliverable will be defined at the discretion of the GCMRC.

12) Raster Data Format

- a) All raster data shall be delivered in Tagged Image File Format (TIFF) file format version 5.0. Refer to Aldus/Microsoft Technical Memorandum dated 8/8/88 for details regarding this specification.
- b) TIFF images that contain georeferencing information must store that information in header tags defined by the GeoTIFF standard. The Baseline GeoTIFF tags must contain at a minimum the following information:

ModelTiePointTag: Gives a pixel coordinate and corresponding map coordinate. It is similar to lines 5 and 6 of the world file.

ModelPixelScaleTag: Gives the dimensions of a pixel in map units. The x and y scale may be different. This is similar to lines 1 and 4 of the world file.

ModelTransformationTag: This is a more comprehensive tag that contains all the information in the other two, and more. It specifies a mathematical transformation from pixel space to map space.

- c) In addition to the above internal header GeoTIFF tags, an external TIFF World File (TFW) must be generated for each TIFF file that contains georeferenced information. This requirement is in addition to generating the internal GeoTIFF tags and is required to support legacy softwares that cannot read GeoTIFF tags.
- d) All TIFF files (both GeoTIFF and non-georeferenced TIFFs) must be readable with no additional processing in the following softwares:
 - 1. ENVI (v 3.4)
 - 2. ERDAS (c 8.5)
 - 3. ESRI (v. 7.0.2 workstation and v. 8.1 desktop and workstation)
- e) GZIP lossless compression allowed. No LZW compression or lossy compression is permitted.

G) Management of Data

- 1) Definition: In this clause “data” is defined the same as in the clause entitled “Rights in Data-Special Works.”
- 2) Policy. The general policy is that the maximum amount and type of data obtained from work under this agreement is to be released. However, data that pertains to sensitive, restricted, or confidential areas will be withheld and protected under the terms of the Rights in Data clause.
- 3) Releasable data. The following general classes of data obtained from work on this agreement are considered releasable:
 - 3.1 metadata of all contracted work
 - 3.2 monitoring data for non-sensitive species or resources (e.g., vegetation, water quality, sediment)
 - 3.3 monitoring data for sensitive species or cultural resources
 - 3.4 data associated with research in support of monitoring

The level of availability of releasable data is dependent on the proprietary level, or protection, assigned to each type of data. The following data have a higher level of protection associated with them:

- a. Endangered species locations and monitoring data
 - b. Cultural artifact locations and monitoring data
 - c. Research data collected in support of monitoring
- 4) Release procedure. The process for releasing data will be in accordance with the Rights in Data clause cited above. While data are to be delivered to GCMRC in accordance with agreements, the availability of the data for use by others is dependent on the class of data and the proprietary level of the data. The following provides a time line and level of availability for release for each class of data:
 - 4.1 **metadata of all contracted work** – within 1 month of completion of project or by first delivery of monitoring data – general release/Internet access.
 - 4.2 **monitoring data for non-sensitive species or resources** - within 2 months of field collection – general release/Internet access.

- 4.3 **monitoring data for sensitive species or resources** – within 2 months of field collection – available to appropriate management agencies (FWS, GCMRC, BOR). Available for general release by request submitted to GCMRC and approval of contact identified in metadata information. – released via disk or agreed to method.
- 4.4 **Data associated with research in support of monitoring** – by November 1st of the year following the data collection– released by request submitted to GCMRC and approval of contact identified in metadata information - released via disk or agreed to method.

REPORTS PREPARATION

- 1) Reports are due in the frequency and containing the information as specified in the Program Description. Additionally, the reports shall include
 - a) A comparison of actual accomplishments to the goals established for the period. Where the output of the project can be readily quantified, such quantitative data should be related to cost data for computation of unit costs;
 - b) Reasons for slippage in those cases where established goals were not met;
 - c) Other pertinent information, including when appropriate, analysis, and explanation of cost overruns or high unit costs.
- 2) Between the required performance reporting dates, events may occur which have significant impact upon the project. In such cases, the co-operator shall inform the USGS as soon as the following types of conditions become known:
 - a) Problems, delays, or adverse conditions which will materially affect the ability to attain program objectives, prevent the meeting of time schedules and goals, or preclude the attainment of project work units by established time periods. This disclosure shall be accompanied by a statement of the action taken, or contemplated, and any Federal Assistance needed to resolve the situation;
 - b) Favorable developments or events which enable meeting time schedules and goals sooner than anticipated or producing more work unit than originally projected.

By the submission and signing of this Application for Federal Assistance, the submitter agrees to provide the information products to the Government as specified in the whole of this announcement. This Attachment will be incorporated in its entirety into any resulting agreement.

Attachment 10

**Grand Canyon Monitoring and Research Center
2255 N. Gemini Dr., Flagstaff, AZ 86001 (928) 556-7217**

PROPOSAL EVALUATION FORM

PRINCIPAL INVESTIGATOR(S) (Name & Address: last name first;
show first name and/or initials as shown in manuscript)

INSTITUTION

PROPOSAL TITLE

PROPOSAL NO.

PROGRAM

A. *[APPLIES TO EVALUATION OF RESEARCH AND MONITORING]* UTILITY OR RELEVANCE OF THE RESEARCH AND MONITORING PROPOSAL - LIKELIHOOD THAT RESEARCH WILL CONTRIBUTE TO PROGRAMMATIC GOAL OR PROVIDE KNOWLEDGE THAT WILL SERVE AS THE BASIS FOR IMPROVED UNDERSTANDING AND MANAGEMENT OF COLORADO RIVER ECOSYSTEM.

B. *[APPLIES TO EVALUATION OF RESEARCH ONLY]* INTRINSIC MERIT OF THE RESEARCH PROPOSAL - LIKELIHOOD THAT RESEARCH OR MONITORING WILL :
-LEAD TO NEW DISCOVERIES OR FUNDAMENTAL ADVANCES WITH REGARD TO PROGRAMMATIC GOALS; PROMOTE TECHNICAL ADVANCES IN THE SUBJECT AREA;
-PROVIDE RESOURCE MANAGEMENT ALTERNATIVES NOT PRESENTLY AVAILABLE; IMPROVE UNDERSTANDING OF THE LINKAGES BETWEEN RESOURCES; ANTICIPATED PARTNERSHIPS/LINKAGES WITH OTHER FACILITIES.

C. *[APPLIES TO EVALUATION OF RESEARCH AND MONITORING]* TECHNICAL SOUNDNESS OF THE PROPOSED APPROACH. APPROPRIATENESS OF HYPOTHESES TO BE TESTED; METHODS ARE APPROPRIATE AND SCIENTIFICALLY VALID; PROPOSED SCHEDULE IS REALISTIC.

D. *[APPLIES TO EVALUATION OF RESEARCH AND MONITORING]* MONITORING AND RESEARCH PERFORMANCE COMPETENCE: CAPABILITY OF THE INVESTIGATOR(S) TO ACCOMPLISH PROJECT; ADEQUACY OF THE INSTITUTIONAL RESOURCES AVAILABLE; PROPOSER(S) RECENT PERFORMANCE AND ABILITY TO MEET PROJECT OBJECTIVES AND SCHEDULE.

E. *[APPLIES TO EVALUATION OF RESEARCH AND MONITORING]* ADEQUACY OF PROPOSED BUDGET: SUFFICIENT INFORMATION TO EVALUTE IF THE BUDGET IS REASONABLE AND REALISTIC FOR TASKS IDENTIFIED.

REVIEWER (Name, address, phone) (CONFIDENTIAL – TO BE BLANKED ON ANY COPY PROVIDED TO AUTHORS)

Attachment 11- SF LLL

DISCLOSURE OF LOBBYING ACTIVITIES Complete this form to disclose lobbying activities pursuant to 31 U.S.C. 1352 (See reverse for public burden disclosure.)		Approved by OMB 0348-0046
1. Type of Federal Action: <input type="checkbox"/> a. contract <input type="checkbox"/> b. grant <input type="checkbox"/> c. cooperative agreement <input type="checkbox"/> d. loan <input type="checkbox"/> e. loan guarantee <input type="checkbox"/> f. loan insurance	2. Status of Federal Action: <input type="checkbox"/> a. bid/offer/application <input type="checkbox"/> b. initial award <input type="checkbox"/> c. post-award	3. Report Type: <input type="checkbox"/> a. initial filing <input type="checkbox"/> b. material change For Material Change Only: year _____ quarter _____ date of last report _____
4. Name and Address of Reporting Entity: <input type="checkbox"/> Prime <input type="checkbox"/> Subawardee Tier _____, if known: Congressional District, if known:	5. If Reporting Entity in No. 4 is a Subawardee, Enter Name and Address of Prime: Congressional District, if known:	
6. Federal Department/Agency:	7. Federal Program Name/Description: CFDA Number, if applicable: _____	
8. Federal Action Number, if known:	9. Award Amount, if known: \$ _____	
10. a. Name and Address of Lobbying Registrant <i>(if individual, last name, first name, MI):</i>	b. Individuals Performing Services <i>(including address if different from No. 10a)</i> <i>(last name, first name, MI):</i>	
11. Information requested through this form is authorized by title 31 U.S.C. section 1352. This disclosure of lobbying activities is a material representation of fact upon which reliance was placed by the tier above when this transaction was made or entered into. This disclosure is required pursuant to 31 U.S.C. 1352. This information will be reported to the Congress semi-annually and will be available for public inspection. Any person who fails to file the required disclosure shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.	Signature: _____ Print Name: _____ Title: _____ Telephone No.: _____ Date: _____	
Federal Use Only:		Authorized for Local Reproduction Standard Form LLL (Rev. 7-97)

INSTRUCTIONS FOR COMPLETION OF SF-LLL, DISCLOSURE OF LOBBYING ACTIVITIES

This disclosure form shall be completed by the reporting entity, whether subawardee or prime Federal recipient, at the initiation or receipt of a covered Federal action, or a material change to a previous filing, pursuant to title 31 U.S.C. section 1352. The filing of a form is required for each payment or agreement to make payment to any lobbying entity for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with a covered Federal action. Complete all items that apply for both the initial filing and material change report. Refer to the implementing guidance published by the Office of Management and Budget for additional information.

1. Identify the type of covered Federal action for which lobbying activity is and/or has been secured to influence the outcome of a covered Federal action.
2. Identify the status of the covered Federal action.
3. Identify the appropriate classification of this report. If this is a followup report caused by a material change to the information previously reported, enter the year and quarter in which the change occurred. Enter the date of the last previously submitted report by this reporting entity for this covered Federal action.
4. Enter the full name, address, city, State and zip code of the reporting entity. Include Congressional District, if known. Check the appropriate classification of the reporting entity that designates if it is, or expects to be, a prime or subaward recipient. Identify the tier of the subawardee, e.g., the first subawardee of the prime is the 1st tier. Subawards include but are not limited to subcontracts, subgrants and contract awards under grants.
5. If the organization filing the report in item 4 checks "Subawardee," then enter the full name, address, city, State and zip code of the prime Federal recipient. Include Congressional District, if known.
6. Enter the name of the Federal agency making the award or loan commitment. Include at least one organizational level below agency name, if known. For example, Department of Transportation, United States Coast Guard.
7. Enter the Federal program name or description for the covered Federal action (item 1). If known, enter the full Catalog of Federal Domestic Assistance (CFDA) number for grants, cooperative agreements, loans, and loan commitments.
8. Enter the most appropriate Federal identifying number available for the Federal action identified in item 1 (e.g., Request for Proposal (RFP) number; Invitation for Bid (IFB) number; grant announcement number; the contract, grant, or loan award number; the application/proposal control number assigned by the Federal agency). Include prefixes, e.g., "RFP-DE-90-001."
9. For a covered Federal action where there has been an award or loan commitment by the Federal agency, enter the Federal amount of the award/loan commitment for the prime entity identified in item 4 or 5.
10. (a) Enter the full name, address, city, State and zip code of the lobbying registrant under the Lobbying Disclosure Act of 1995 engaged by the reporting entity identified in item 4 to influence the covered Federal action.

(b) Enter the full names of the individual(s) performing services, and include full address if different from 10 (a). Enter Last Name, First Name, and Middle Initial (MI).
11. The certifying official shall sign and date the form, print his/her name, title, and telephone number.

According to the Paperwork Reduction Act, as amended, no persons are required to respond to a collection of information unless it displays a valid OMB Control Number. The valid OMB control number for this information collection is OMB No. 0348-0046. Public reporting burden for this collection of information is estimated to average 10 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Budget, Paperwork Reduction Project (0348-0046), Washington, DC 20503.